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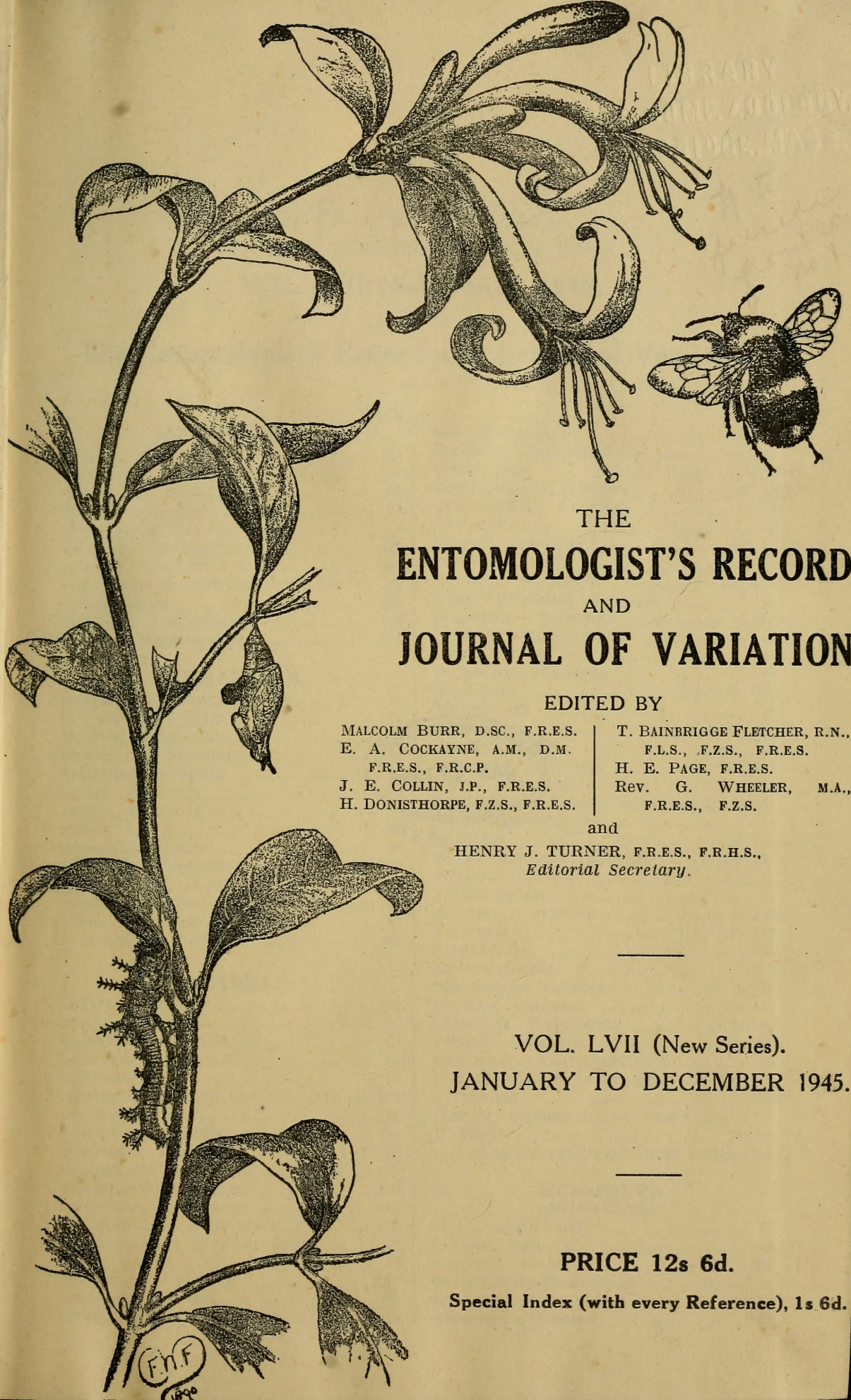
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JOURNAL OF VARIOUS



THE
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AND
JOURNAL OF VARIATION

EDITED BY

MALCOLM BURR, D.SC., F.R.E.S.
E. A. COCKAYNE, A.M., D.M.
F.R.E.S., F.R.C.P.
J. E. COLLIN, I.P., F.R.E.S.
H. DONISTHORPE, F.Z.S., F.R.E.S.

T. BAINBRIGGE FLETCHER, R.N.,
F.L.S., F.Z.S., F.R.E.S.
H. E. PAGE, F.R.E.S.
Rev. G. WHEELER, M.A.,
F.R.E.S., F.Z.S.

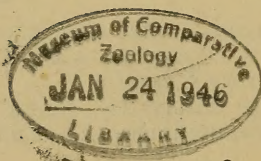
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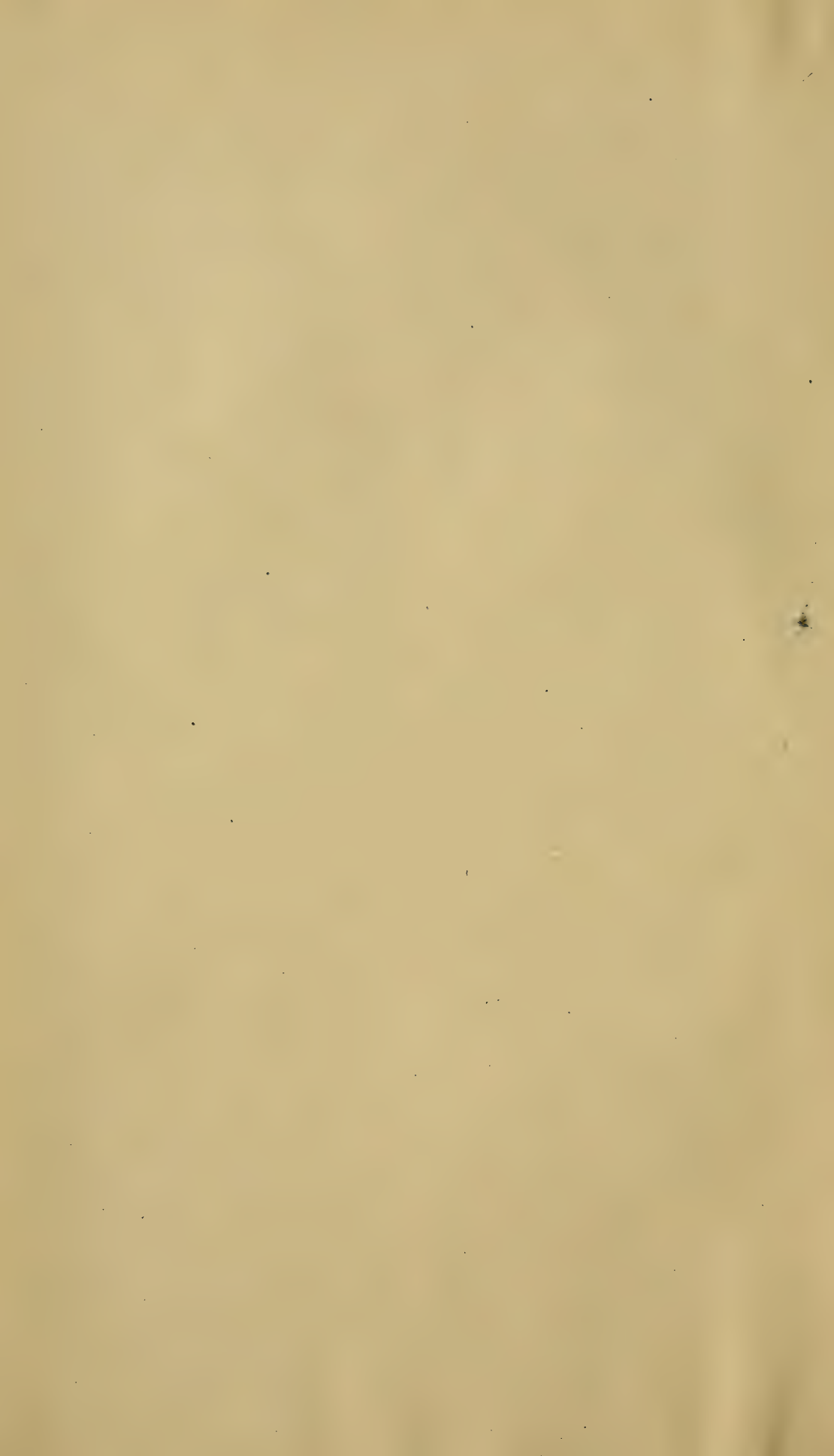
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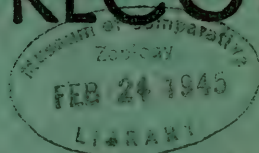


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Vol. LVII.



ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION



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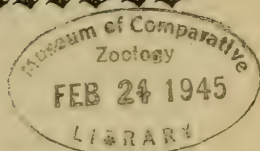
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VOL. LVII

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No 1

LEPIDOPTERA NEW TO, OR RARE IN, THE OUTER HEBRIDES.

By Professor J. W. HESLOP HARRISON, F.R.S.

Throughout the war period, as circumstances have permitted, we have continued our investigations into the Flora of the Inner and Outer Hebrides. Necessarily, as a sort of by-product, we have worked the Lepidoptera in the same areas, with the consequence that the number of species in that group new to the Outer Isles has continued to mount up. Further new facts, distributional and otherwise, concerning other insects have also emerged. As the whole of this information is needed now for zoogeographical purposes, it has been decided to put it on record immediately.

Argynnis aglaia, L.—We have now observed this species on most of the islands, great and small, in the Outer Hebrides from Benbecula in the north to Pabbay in the Barra Isles in the south. In almost every case the form captured fell within the limits of the var. *scotica*, Watkins, although the melanochoirism varied from isle to isle, being at a maximum on Pabbay and at a minimum on Flodday (near Sandray), where its size was likewise small.

On Benbecula only one specimen was seen, and in all probability the insect does not maintain a permanent foothold there. For several reasons, it is considered that the area between Spin and Loch Eynort, on South Uist, constitutes its last real stronghold northward; there, in the Allt Volagir ravine, it was still flying strongly in the early days of September 1944.

Coenonympha pamphilus, L.—Prior to our researches, the position of this insect in the Outer Hebrides was very unsatisfactory. Beginning with Macgillivray (1940), who “remembered” having observed it on St Kilda, our knowledge ended with the records due to Dale, who worked on Harris and North Uist in 1883 and 1884. South, who published the latter records in the *Entomologist*, Vol. xxi, p. 98 (1888), neglects to indicate upon which island the insects were captured. Campbell (*Scott. Nat.*, November-December, pp. 153-163, 1938) supplies no localities for it on the Barra Isles. In this paper we can report colonies as existing on Harris, North Uist, South Uist, Eriskay and Mingulay. From this list it will be clear that no record yet exists of its presence on Barra itself, although the single Mingulay specimen guarantees its occurrence in the Barra group. In 1942 *C. pamphilus* was very plentiful on South Uist in the beginning of June.

Cerura furcula, L.—When the fringe of willows growing along the Allt Volagir just above its entrance to Loch Eynort was beaten this summer, a single larva of this species was obtained.

Notodonta ziczac, L.—Larvae may be obtained, not uncommonly, from *Salix atrocinerea* along the Allt Tomnaval, N. Harris, and from the same shrub, *S. aurita* and the aspen (*Populus tremula*) on the lower slopes of Beinn Mhor, low down the Coire Dubh, and on the Allt Volagir on South Uist. Owing to the fact that the larvae are light-sensitive, many wonderful colour varieties occur. The insect has not yet been detected in the intervening isles.

Tethea duplaris, L.—Larvae beaten from birch (*Betula pubescens*) on the Allt Volagir, S. Uist.

Spilosoma lutea, Hufn.—Around Arinambane, the ruined inn on the north shores of Loch Eynort occupied last when it was the port for S. Uist, grow dense masses of nettles which support this species; larvae beaten August, 1944.

Euxoa nigricans, L.—Not rare on ragwort in August 1944 near the schoolhouse, Loch Eynort, S. Uist. The forms ranged from var. *fumosa*, Haw., to the extreme melanic form *fuliginea*, Godart.

Amathes agathina, Dup.—Larvae plentiful in May and June on the moorlands of South Uist; imagines on N. Uist.

A. castanea, Esp.—A single example at ragwort, Loch Eynort, S. Uist.

Diarsia dahlui, Hb.—Thinly distributed on sheltered moorland areas from North Harris to South Uist; odd examples of var. *rufa*, Tutt., near Loch Ceann-a-Bhaigh, S. Uist.

Mamestra glauca, Hb.—Distribution much the same as the preceding with the addition of Barra; larvae on heather, etc.

Hadena nana, Rott.—Rare on Vatersay.

H. capsicola, Hb.—On *Lychnis* near the Square, Isle of Vatersay; not common.

H. cucubali, Fuesl.—Since we made the first Outer Island record for this insect from Mingulay, Campbell (*l.c.*) has noted its capture on Barra; now Uig, Lewis, far to the north, as a new habitat may be added.

Euplexia lucipara, L.—From North Harris to Barra, not rare on *Pteris*, *Lastrea*, *Osmunda* and other ferns.

Petilampa minima, Haw.—An odd specimen taken flying over the heather between the Allt Tomnaval and Maarraig River, North Harris.

Leucania comma, L.—Captured on the Isle of Berneray (Sound of Harris) in July 1939.

Phytometra viridaria, Cl.—In fair numbers between Auratote and Coire na Cuile, South Uist, June 1942.

Abrostola tripartita, Hufn.—Larvae in general not rare on nettle patches from Harris to Vatersay; very common indeed around Loch Bornish and Ormaclett, S. Uist, in 1944.

Ortholitha chenopodiata, L.—Common in the south east of Barra, near Castlebay, and between Daliburgh and Stoneybridge, S. Uist.

Carsia paludata, Thnbg.—One specimen from the Sron an Toister area, North Harris, and also one from the Abhainn Gheatry banks, S. Uist; almost certainly more common than these August records would indicate.

Chloroclysta miata, L.—Larvae not rare on willow, rose, birch, etc., from Harris to Barra; imagines at willow catkins in spring on North Harris and North Uist.

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Thera cognata, Thnbg.—Not uncommon from Benbecula to Muldoanich on *Juniperus sibirica*; the forms *griseata*, Fuchs., and *nigrofasciaria*, Hoffmann, prevail. The species was not noted on Barra.

T. juniperata, L.—Attached to the same species of juniper as its ally, and occurring on Benbecula, S. Uist, and Muldoanich. In 1944 the larvae were dislodged in great numbers from an enormous prostrate shrub growing in the Allt Volagir area, S. Uist. From these very small forms of var. *scotica*, B. White were reared. This colony was not a mixed *cognata-juniperata* assemblage.

Xanthorhoe munitata, Hb.—From Harris to Barra, but never plentiful.

Calostygia solicata, Hb.—Rare near Lochboisdale, S. Uist.

Perizoma adaequata, Borkh.—Not rare on Taransay (Harris) and Watersay; in all probability occurring on the intervening islands.

P. minorata, Treitsch.—In small numbers on Muldoanich only.

Eupithecia oblongata, Thnbg.—Larvae very plentiful on the South Uist machair in 1944, especially in enclosures.

E. goossensiata, Mab.—On heather from the Isle of Pabbay (Sound of Harris) to S. Uist.

Nyssia zonaria, Schiff.—Very abundant as the small race *atlantica* from Barvas (Lewis) to the Isle of Pabbay (Barra Isles) on dune and machair. In general, the preferred food is *Lotus corniculatus*, but yarrow, clover, knapweed and very many other foodplants serve.

Hepialus humuli, L.—From Lewis to Barra.

Phlyctaenia lutealis, Hb.—Vatersay only, and rare.

P. fuscalis, Schiff.—Common on moorland, South Uist.

Mesographe forficalis, L.—Distinctly rare on Vatersay.

Peronea variegana, Schiff.—Beaten from hazel, birch, etc., in the form of the var. *albana*, Westwood, in the Allt Volagir hazel wood on S. Uist.

P. hastiana, L.—Seemingly not previously recorded from the outer Isles; larvae, however, abound on *Salix aurita* and are to be found to a less extent on *Salix atrocinerea* and *S. repens* from Lewis to Sandray and Pabbay (Barra Group).

Depressaria applanata, F.—Larvae on *Angelica sylvestris*, Trollamarig, North Harris.

Nepticula anomalella, Gz.—Very plentiful on *Rosa dumalis (glauca)* var. *subcristata*, in the Allt Volagir gorge, a first record for the Outer Isles, and extending its range from Rhum, where it was first discovered in August 1944.

LEPIDOPTERA OF SUSSEX AND W. HANTS—1944.

By Commander G. W. HARPER, R.N.

This has been a sunless and cool summer; to all intents and purposes the sun hardly shone between Whitsun and the middle of August; the Spring, however, was sunny, with a very cold frosty spell in the middle of May, and with temperatures down to 16° F. at night.

In spite of this, my notebook, rather sketchy of course, due to pressure of the war, indicates a surprising resilience by Lepidoptera to the weather.

January.—*V. atalanta* on the wing on the 30th and 31st.

March 19th.—*Brephos parthenias* abundant on the birches and salwos. *V. io*, *Polygonia c-album*, and *Gonepteryx rhamni* common.

April 23rd.—*Pieris napi*, *Pararge aegeria*, *Euchloë cardamines* well out, the last including a large number of the dwarf form in the male sex. On the 30th I saw the first *Brenthis* (A.) *euphrosyne*, a lovely and cheering sight, but it was not fully out in the woods for another week, when I saw several pairs *in cop.* By the end of April also *Thecla rubi*, *Pararge megera* ♂ ♀, *Erynnis tages*, and *Syrichtus* (P.) *malvae* were all active. I saw one *Lycaenopsis argiolus* ♂ only, which has been scarce in my experience for a number of years. The second brood this year has been very abundant indeed, the butterflies frequenting the lanes leading onto the downs as well as the main roads, gardens and woods. I suggest that possibly the frosts in the middle of May reduced the parasite to a greater extent than the young larvae.

In April, too, *Euclidia mi*, *E. glyphica* were out, whilst *D. cultraria* was very common in the beech woods.

May.—Intermittent sharp frosts, cold east winds, and warm sunshine. *L. sinapis* appeared on the Sussex-Surrey borders on 7th May, in good numbers. The usual spring moths were to be seen on tree trunks and fences. *Hemaris fuciformis*, though common, was not abundant this year, and I only saw one *H. tityus*. Undeterred by the cold weather, *Callimorpha jacobaeae* appeared in the usual quantity about the 22nd, as also did *Polyommatus bellargus*, *Aricia agestis*, and *P. icarus*, the last definitely commoner than last year. *Brenthis* (A.) *selene* was out in some numbers by the 28th, while *B.* (A.) *euphrosyne* was only beginning to show signs of strain! As the latter was out at the end of April, it seems clear that the cold nights spread the emergence to a later date than usual. On the 29th *Hamearis lucina* was still fresh on the downs, and the same day I watched *G. rhamni* ovipositing on buckthorn.

June.—On the 15th I found two *Smerinthus ocellata* *in cop.*, and on 17th two *Sphinx ligustri*, so the Hawks seemed to be running pretty well to form; I found *S. ocellata* ova as late as 21st July, but then this specimen is well known to spread its emergence widely, though I do not know if the spread varies with the incidence of cold weather. During the great gale of 19th June I took to the woods, and found several *Limenitis camilla* pupae, and the butterflies emerged, as also in the wild, on 22nd June. They were not quite as plentiful as last year. *Procris* (Ino) *geryon* was abundant on 23rd June, and I also took ♂ ♀ *P.* (I.) *globulariae* the same day—lack of sunshine and limited time did not permit finding more. On 25th, *Melitaea athalia* was well out in Abbot's Wood, and its environs, and one curious observation on this day was a large ♂ *E. cardamines*, the latest I have ever seen it in the south, very worn *B.* (A.) *euphrosyne*, and moderately worn *B.* (A.) *selene*, all out together with *M. athalia*. I think this is proof of the delayed emergence, or spread, caused by the extraordinarily inclement weather. *Argynnis cydippe* (*adippe*) was freshly out in both sexes at the same time.

July.—On the rare occasions of a gleam of sunshine, the usual butterflies seemed about normal, *Argynnis paphia* being abundant in many woods, and to my joy after being prevented by years at sea, I saw my first *Apatura iris*, testily snapping his wings at every *T. quercus* ap-

proaching him as he sat on his throne on an oak tree. I also saw another "sailing" over high ash trees. By the end of the month *L. argiolus* second brood was abundant, and a delight to watch everywhere. *G. rhamni*, so common in the Spring, also had not suffered, as a splendid emergence occurred; in one inland wood I counted twelve, in about equal numbers as regards sex, in sight at one time, and this profusion persisted an hour or two. *Polyommatus* (*L.*) *coridon* I found out in some numbers by the 21st of the month, and the quantity from then on seemed about normal, i.e., rather less than last year. *T. quercus* was unusually abundant, every oak in some woods possessing many pairs. Opportunities for observing moths were scanty, but beating and dusking showed many of the usual kinds to be present; in particular I made the acquaintance of three "footmen," having been shown the knack of beating them by the kindness of Captain Jackson, R.N.

August.—*Leptidea sinapis* produced a very good second brood which was past its best on 4th. Mr F. W. Frohawk says that this butterfly does so by no means every year; what then are the operative causes? Apparently not nice warm weather! On the 7th, *H. comma*, the "Silver-spotted Skipper," was abundant and fresh everywhere on the Downs; this is about the normal date; last year the butterfly was out on 25th July. *P. (L.) bellargus* second brood was out by the 9th.

September.—Not having seen a single *C. croceus* earlier, I was not surprised when no brood turned up this month. A ♀ *Herse convolvuli*, in fair condition, was brought to me on 5th, so immigrants were not entirely absent apparently. I was lucky to find *T. betulae* on the 13th; three females sitting about on the blackthorn bushes on the W. Hants Downs; although there were plenty of bramble and hemp agrimony blossoms, they did not seem attractive, and I saw no males. I found one ovum. I had never seen this beautiful little butterfly before. *Heodes phlaeas* was very abundant everywhere this month, but I saw no very striking varieties.

October.—Ivy blossom visited on 19th produced a few fresh *Miselia oxyacanthae*, *A. lychnidis*, and, of course, *P. meticulosa*. Tree trunks and walls are still producing *A. flavicincta*, *G. ornitopus*, and *O. dilutata*, whilst rotting apples are, as ever, attracting *V. atalanta*, *Aglais urticae* however being less common than usual.

With regard to larvae, time has not allowed me to do much. I have found and bred a few *S. ocellata* and *S. ligustri* from ova; *Notodonta ziczac* also, and a fine "colony" of *Cucullia verbasci* I found feeding on *Buddleia globosa* have one and all proved to be ichneumonated; one or two medium sized pupae were found in each cocoon. Young birch trees and sloes have produced a mixed bag this autumn, mostly of small geometers, with an occasional *Drepana lacertinaria*, and *L. capucina*.

To sum up, I think that largely by dint of spreading their emergence many of the Lepidoptera have managed to hold their own against the unpropitious weather, and perhaps to compensate for it by producing unusually good second broods. Migrants appear to have been in smaller numbers than usual, and certainly less than last year.

OBSERVATIONS ON BRITISH ORTHOPTERA, 1944.

J. A. WHELLAN, B.Sc.

The following account is the result of observations made during the past summer. I attempted to find out the kind of habitat favoured by each species, besides the mere locality. Dr Uvarov made the valuable suggestion that the habitat of the nymph is the really important thing, as owing to their greater powers of movement adults tend to become more widespread. Unfortunately, the suggestion came too late to be widely applied. Secondly, I have tried to differentiate and describe the stridulation of the species encountered. Differentiation is easy, and requires merely a little patience, but satisfactory description is very difficult. For distribution I have used the vice-county system, so long and satisfactorily used by botanists. I wish that entomologists generally would do the same. Captain J. L. Harrison gave help in capture and identification at Bookham Common and Norbury Park, otherwise I am responsible for identification. In the case of *Roeseliana roeselii*, Hgb., and *Chorthippus albomarginatus*, De Geer, Dr Uvarov kindly confirmed the names.

Acrydium subulatum, L.—Captain Harrison caught one mature example in a wet grassy place on the border of a pond on Bookham Common, Surrey, 9.7.44.

A. vittatum, Zett.—Box Hill, Surrey, 7.8.44. Half grown and mature specimens seen on very dry stony ground. Probably common here. On Galleywood Common, S. Essex, I found a colony on the wet clay margin of a pond where there was very little vegetation. All were immature on 18.8.44; the majority mature, although there were still some half-grown nymphs, on 30.9.44.

Stenobothrus lineatus, Panzer.—Seen in rather dry, grassy places at Bookham Common, Norbury Park, and Box Hill, Surrey.

Omocestus viridulus, L.—Although one of the common grasshoppers in N.W. England and Wales, in the S.E. it seems to be much more local and is absent from a large part of Essex. Its song is very characteristic, well described by Burr. It reminds me of a very rapidly ticking wrist watch. It likes grassy places with, however, a variable degree of humidity. S. Essex.—In an open, heathy part of Epping Forest. E. Suffolk.—In lush grass, near a pond but quite dry on Bixley Heath. W. Norfolk.—Dry, grassy margin of a field near Thetford.

Myrmeleotettix maculatus, Thunberg.—In dry, heathy places. Thurstaston Common, Cheshire, abundant. Wimbledon Common, Surrey.

Chorthippus bicolor, Charpentier.—On grasslands, cultivated fields, heaths, downs, etc. In dry places. Plentiful in N. Essex and Surrey. Thurstaston Common, Cheshire. Abundant in the sandhills at Freshfield, S. Lancs. Rushton, Northants. Bixley Heath, E. Suffolk. Risby Poors Heath, W. Suffolk. About Thetford and Garboldisham, W. Norfolk.

Chorthippus parallelus, Zett.—I have had little success in trying to distinguish the kinds of habitat preferred by this species and *Ch. bicolor*. Very often they occur together and in almost equal abundance. I found it in the localities mentioned for bicolor except at Freshfield and the W. Suffolk and Norfolk localities. Also in a moist grassy place at Redgrave Fen, W. Suffolk. At Bexley Heath *bicolor* seemed to prefer the dry

heath proper and *parallelus* tended to replace it in the lusher grass towards the ponds. In many of the Essex localities *bicolor* was abundant in stubble fields. *Parallelus* tended to be restricted to their grassy margins or neighbouring grass fields.

Chorthippus albomarginatus, De Geer.—This species undoubtedly prefers damper grassier places than either of the two preceding. Very often its habitat is near the sea, even actually in salt marshes as at E. Mersea, where it lives in the Suaeda, etc., composing the salt marsh. Where a broad raised bank, covered by long dry grass, traverses the marsh, *Chorthippus bicolor* completely replaces it. Thus my observations are directly opposed to Burr's and seem more in agreement with Chopard's. S. Essex.—Common in damp reclaimed meadows at Tilbury. In long grass in damp ground near the cricket ground, Chelmsford. In a damp hollow on Galleywood Common. In long grass at Writtle. N. Essex.—In long grass by a pond and nearby ditch, Springfield. On grasses and salt marsh plants at the Strood and E. Mersea. From one female which I dissected I extracted eleven eggs. They were cream coloured, ellipsoidal and measured 0.17×0.04 of an inch. They almost filled the abdominal cavity.

Gomphocerus rufus, L.—Plentiful in dry grassy places, nymphs and imagines, 7.8.44, on Box Hill, Mickleham Downs, and at Norbury Park, Surrey.

Leptophyes punctatissima, Bosc.—A rather inactive insect which I have found, both nymphs and adults, on low growing trees and shrubs such as oak, hazel, bramble. Surrey.—Bookham Common. S. Essex.—Woodham Walter Common, on oak. N. Essex.—Near Springfield on bramble. Nymphs in two woods near Colchester on hazel and brambles. A captured male arched its elytra at about 30° and vibrated them vigorously as other tettigoniids do but I could not detect any sound. Like **Pholidoptera cinerea*, Gmel., *Metrioptera brachyptera*, L., and probably other species, *Leptophyes* is very particular about cleanliness. Several times I have watched these insects as they slowly and repeatedly drew antennae and legs through their mouth parts. *Chorthippus bicolor* draws its short antennae through the spines on its fore legs.

Pholidoptera cinerea, Gmelin.—Hedgerows and the thick herbage at their bases are the habitats which this insect prefers. In such places it is common throughout Essex. Surrey.—One in a rather open place in long grass on the downs in Norbury Park. Northants.—Common in hedgerow between Duddington and Bulwick, 8.10.44, the latest date seen. This is a very secretive insect, very difficult to track down even when its chirp is recognised. Nymphs are less wary. I have seen them in woods near Colchester sitting about on bramble leaves. It has powerful jaws. A female which I handled carelessly gave me a severe nip and escaped as a result. Another which I kept with a *Chorthippus bicolor* soon killed and partially ate it. Though in fine weather it chirps throughout the day, it is most vigorous for two or three hours after sunset. On one occasion at 1 a.m. G.M.T. it was still quite active. The stridulation is usually a single "tss" repeated at intervals. Occasionally three or four such chirps follow in rapid succession. It reminds me of the cricket's note but is thinner, fainter and more high-pitched.

Metrioptera brachyptera, L.—Thursley Common, Surrey, amongst *Calluna* and *Erica cinerea* on dry ground.

Roeseliana roeselii, Hgb.—This insect has hitherto been regarded as rare and restricted to the East coast. I was therefore surprised to find it abundantly in the district round Chelmsford, N. and S. Essex. So far as I have been able to ascertain, its range extends from Broomfield almost to Danbury covering a belt of country 2 miles \times 5 miles. It is even present in one locality in the centre of Chelmsford. I also heard what I am sure was its unmistakable chirp at Elmstead Market and Thorpe le Soken but had no time to track the insect down. It thus seems that its range in Essex is considerable and it should be sought in neighbouring counties, particularly Suffolk. Its habitat is always the same, long grass on the borders of lanes and fields or in rough uncultivated ground neither particularly damp nor very dry. I have found it in an area of such grass covering as little as two square yards. It is an active insect. When stridulating it rests on grass stems either high up or low down. If the grass is shaken by a footfall it immediately drops to the ground and darts away through the undergrowth. It seems to be entirely diurnal and, moreover, is rarely heard except in sunny weather. Except in captivity I have never heard it stridulate at night. The stridulation is a long continued reeling note. On one occasion I timed an insect which reeled continuously for 90 secs., but I suspect that sometimes the reel lasts much longer. In its production the elytra are raised about 30° and rubbed together so that they appear a mere blur. I estimate that I clearly saw 30 individuals. Only one of these was macrop-terous, a male. I could distinguish no difference between its note and that of the normal form. The pale border to the pronotum and the pale markings on legs and abdomen are usually straw coloured. In about ten per cent. of the insects these pale markings were bright apple green. This colouring does not appear to depend on age.

*[This name, *cinerea*, Linn., is based on an error in Burr's *British Grasshoppers*, p. 136. Linnaeus never named it at all. It was named *Gryllus cinereus* by Gmelin in 1790 in *Linn. Syst. Nat.* (ed. xiii) after Linnaeus' death. It had previously been named *griseo-aptera* by De Geer (1773) and Retzius (de Geer's *Genera et Species Ins.*, p. 92, No. 471: 1783) and its correct name therefore is *Pholidoptera griseo-aptera*.—T.B.-F.]

COLLECTING NOTES.

REMARKABLE OCCURRENCE OF NECROPHORUS.—I am indebted to Mr E. E. King, of Sunnyside, Gargrave, Skipton, Yorks, for a red and black beetle that I take to be *Necrophorus investigator*, Zett., judging from Joy's *British Beetles*, that occurred under remarkable circumstances. Mr King writes:—"It was found in the condensed water that was being caught by a glass vessel, placed by the side of an autoclave which is situated in a bacteriological laboratory attached to the Company where I am employed. The specimen was still alive, but evidently the hot water had upset it and after struggling to regain its health and vigour it died the following day." The circumstances seem so unusual that I think the case is worth recording.—MALCOLM BURR, Istanbul, 22.10.44.

TACHYSPHEX POMPILIFORMIS ATTACKING IMMATURE GRASSHOPPERS (Hym.: SPHECIDAE).—At Rodborough on 30.v.1944 a black-and-red wasp was attacking an immature green grasshopper. I caught the wasp but, unfortunately, either the grasshopper was swept away by the rim of the net or it was not yet stung and so able to hop away; anyway, when I had dealt with the wasp I was unable to find its prey, which may have been a half-grown *Omocestus viridulus*. On 15.vi Mr Donisthorpe, who was collecting with me at Rodborough, saw a black-and-red wasp (similar to a *Tachysphex pompiliformis* taken by me a few yards away on the same occasion and to my previous capture on 30.v) dragging a last-stage nymph of *Myrmeleotettix maculatus* on to a leaf, where it proceeded to sting its prey repeatedly; unfortunately, the wasp escaped, but the grasshopper was recovered. On subsequent visits to the same locality I saw a few more of the wasp, which is very difficult to catch, but was unable to observe any more with prey. Saunders (*Hym. Acul.*, p. 80) said that "Smith has taken *T. [pompiliformis]*, Panzer=*pectinipes* [nec Linn.]" at Weybridge with a small species of grasshopper," and there may be later records since then, but Mr H. M. Hallett, with very considerable experience of *T. pompiliformis*, especially in Glamorgan, writes (*in litt.*, 28.vii.44) that he has never caught this wasp with prey. Curiously enough, this is the first year that I have taken *T. pompiliformis* here.—T. BAINBRIDGE FLETCHER, Rodborough, Glos., 4.xi.1944.

AT TORQUAY RECENTLY—*Leucania l-album* is now (October 28) a pest and so was *P. gamma* about five days ago. It must have been an influx. I have seen only one *Colias edusa* during the whole year and three *Agrotis saucia*, which is usually common here.—C. J. PARSONS.

EFFECT OF ABNORMAL WEATHER OF 1944 ON INSECT LIFE.—In this area, mostly downland, but with many gardens and the large woods near Polegate available for occasional visits, 1944 has been on the whole a poor year for butterflies. No one in this family has seen any "painted ladies" or any rarities, and only about two "clouded yellows" have appeared. The three *Pieris* species have been less abundant than usual, especially the "large white," no immigrations of which have been noticeable. On the other hand "orange tips" and "holly blues" have been commoner than usual. The holly and ivy on which holly blue larvæ feed, being tough evergreens, have not been affected like ordinary trees by the drought in spring and early summer. Fritillaries have been fairly plentiful in the earlier months, and "meadow browns," "wall" butterflies and common "blues" abundant in the later part of August.—L. RICHMOND WHEELER.

NOTES FROM THE NORTH OF IRELAND, 1943 (*continued from page 60*).—On 13th June a single *Vanessa atalanta* was observed at rest on a wayside bank, and the first of a local brood of *Smerinthus ocellata* appeared in the breeding cage; as a rule this species is generally more abundant in this district than *Laotaoë populi*. The latest information given in South's *British Lepidoptera* (revised edition) quoting Kane, "that it is widely distributed but usually scarce," is quite incorrect; as Col. Donovan states that it is "common as larva all over Ireland."

About the middle of the month *Platyptilia tesseradactyla* was common in its restricted locality near Cookstown; and *Endothenia oblongana* was observed in numbers among *Scabiosa Succisa*; there are two broods of this species in this district, the first in June, the second about the middle of August.

Eucosma farfarae was abundant flying over its foodplant in the afternoon on 26th June, and one all-brown form was taken similar to those recorded by Barrett from Co. Durham.

Plusia festucae was common at dusk over Bladder Campion (*Silene inflata*), one example occurring with the gold spots on disc of forewings confluent, ab. *juncta*.

In early July *Tortrix consimilana* was common flying in the afternoon, not among privet but along a beech hedge.

Polyommatus icarus was common on a railway bank near Coalisland and flying with it were a number of *Zygaena lonicerae* and *Z. filipendulae*; a male *icarus* aberration taken here is of the *nigromaculata* form, but it has a marginal series of black spots on the forewings as well.

About the middle of the month *Argynnis aglaia* was frequently observed on the hills near Pomeroy; a fine male was taken of a pale biscuit colour and the spots very indistinct. At the same time *Epagoge (Capua) grotiana* was beaten out of oak scrub growing on the hillside, and *A. paphia* was not rare in several of the little glens.

Early in August the males of *Philedone gerningana* were flying in numbers over the heather in the afternoon in a nearby bog; the females appeared later in the evening sitting on the heather tips.

Vanessa atalanta was fairly common during the month but only a single *V. cardui* was observed.

Hydroecia crinanensis was common at scabious flowers in the daytime and *Helotropha leucostigma* appeared at ragweed after dark.

In early September, near Glenties in Western Donegal, the larvae of *Tethea* or had been abundant in a group of aspens growing in a sheltered ravine.—THOMAS GREER, 14th September 1944.

COLLECTING IN 1944 AT LITTLE ORCHARD, BROAD OAK, NEAR CANTERBURY, KENT.—*Leucania albipuncta*—Whilst sugaring near here on the night of 22nd August of the present year I took a worn ♀ of this species. The same night, which was warm and cloudy with a moderate easterly breeze, quantities of moths were attracted to the sugar patches, though mainly the more common species. *Noctua c-nigrum* were very numerous, as were *Noctua umbrosa*, *Leucania pallens*, and *Noctua xanthographa*. I also noted *Hydroecia micacea*, *Thalpophila (Cerigo) matura*, *Noctua plecta*, *Agrotis puta*, *Apamea (Xylophasia) monoglypha*, *Triphaena interjecta*, *Apamea secalis*, *Helotropha leucostigma*, and the pale banded form var. *fibrosa*.

On some marshy ground adjoining, various species were to be found sitting about on grasses—of these I noted several *Arenostola phragmitidis* and *Nonagria geminipuncta*, both of which were becoming worn, also a few *Sterrhæ (Acidalia) dimidiata*, *Rivula sericealis*, and *Luperina testacea*. Several *Cerapteryx graminis*, all of which proved to be males, were attracted to torchlight.

On this particular night I had hoped to see *Plusia festucae*, but not one did I observe, although in previous years I had noted it at dusk flying plentifully over flowers of water mint.—J. M. CHALMERS-HUNT.

COLOUR CHANGES OF LEPIDOPTEROUS EGGS.—In Vol. I of this Journal, at pp. 107-8, Captain R. B. Robertson described the egg of *Dasycampa rubiginea*, Fab., as "milk white when first laid, pale straw colour two or three days after, and turns a salmon pink before hatching, with black ring on top, or rather right round it." In Vol. IV of the same Journal, however, Dr W. S. Riding describes the egg of the same species as "when first laid . . . pale primrose, and became mottled reddish-brown in about three days, remaining so till they assumed the usual leaden hue, shortly before the emergence of the larva." Both these observers were experienced lepidopterists, and there can be no question that the description given by each is correct. If therefore the eggs described by one observer turned "pale straw colour two or three days after" they were laid, and those of the other "mottled reddish-brown in about three days" it would seem that in this species at least the colour of the egg is determined by ecological factors. Have other observers noticed this with other species? The physiology of the colour changes in the chorion of lepidopterous eggs does not appear to have received attention.—P. B. M. ALLAN.

LARGE TORTOISESHELL BUTTERFLY (NYMPHALIS POLYCHLOROS, LINN.).—In the daily Press recently this species has been referred to as an immigrant. It may be of interest to record that to my knowledge it has been breeding regularly in the Swanage district since 1909, and is well established. 1928 and 1933 were particularly good years for it.—LEONARD TATCHELL, Swanage, September 1944.

CURRENT NOTES.

GREAT WORK BY JEANNEL.—It is gratifying to know that the great work of Entomology has been going on in France through these past difficult years. In 1942, Dr René Jeannel produced a fine work, *La Genèse des Faunes terrestres: Elements de Biogéographie*. It was published by the Presses Universitaires de France, 108, Boulevard St. Germain, Bibliothèque de l'Institut maritime et colonial.

Although based on a detailed study of cavernicolous Coleoptera, and so difficult for the non-specialist to follow minutely, abundant other material is collected and marshalled, with the result of a very important contribution to the subject. Dr Jeannel is an enthusiastic Wegenerite, and his book will be very helpful to zoologists, and to botanists, alike.—M. B.

A CAVERNICOLOUS EARWIG.—I hear that M. Chopard has published a description of a completely new form of earwig having the characteristic features of a genuine cavernicole. I have not yet been able to procure details, nor even the references, but no doubt that will soon be available. This is a remarkable, but hardly a surprising, thing, and it will be most interesting to trace its affinities.—M. B.

A CORRESPONDENT of the *Ent. News* has called attention to a comment in *Nature* on the publications of Darwin's volume on the "Variation of Animals and Plants under Domestication" in 1868, as the foundation of a new "ism," which is called "Darwinism," and asserted that the word "Darwinism" has become as familiar as "Galvanism" or "Mor-

monism." The writer in the *Ent. News* remarks that "with the passing of the years, the sole survivor, at least in common English usage, is Darwinism." Evidently the "survival of the fittest" works as well for *isms* as for organism, and despite its ups and downs, Darwinism sings to-day as loudly and lustily as ever."

WE have received a consignment of the *Transactions and Proceedings of the Royal Ent. Society* published in early autumn. It consists of (1) a general Review of the Classification of the Genitalia of the Argynnidi with a special consideration of the genus *Biloria* (Nymphalidae), of which the typical species is the well-known *Biloria pales*. This is a study by B. C. S. Warren, who has already done fine work on the HesperIIDae and on the genus *Erebia*. (2) A Study of the Mechanism of the spiracular, regulatory apparatus in adult Diptera and other insects. This is by A. A. G. Hassan. Both these papers are well illustrated. The *pales* paper is illustrated by 170 figures of the three species made of the *pales*. There are 170 figures of imagines and 147 figures of genitalia of both the Argynnidi and of the *pales* group. The three Sections of the Proceedings are also sent out. A.—General Entomology, parts 1-6, with fifteen smaller articles, four on Diptera, two on Lepidoptera, two on Coleoptera, and one each of the rest; 72 pp. B.—Six parts of Taxonomy; 68 pages of 13 articles. We note that L. G. Higgins corrects an error in his Catalogue of the *Melitaea*. Of these, five deal with Coleoptera and two with Diptera. And C.—The Journal of Meetings, and includes the List of Fellows with the Balance Sheet and details of the Annual Meeting.

ALSO have come to our table: A copy of the *Boletin de Entomologia Venezuela*, Vol. iii, Pt. 1, consisting of four articles, of which one deals with the Sphingidae, another Diptera, and a third Neuroptera. It is well produced and contains illustrations. From the Argentina Capt. Hayward sends us five separates, all of which are on pests. Mr D. G. Sevastopulo sends on another (part xiii) of his contribution on the Early Stages of Indian Lepidoptera.

As a Supplement to this magazine in 1925-6 (vols. xxxvii-viii) we published a "*List of the Geometers of the British Isles* with the named Varieties and Synonyms in general use, classified according to the Nomenclature, Arrangement (and kind assistance) of the late L. B. Prout, in Seitz *Macro-Lepidoptera* IV (Palearctic Geometers), with references to Seitz, Meyrick and South."

Of this List we have only a few copies left, which are in Mr H. W. Andrews' hands. It has been suggested that we either publish the few alterations made by Prout with the addition of the further varieties recognized in the Supp. to Seitz, vol. IV: Palearctic Geometers, or we arrange to issue a second edition of the List with all numerical references revised. This latter is a much more formidable task for which we must obtain considerable help. L. B. Prout had become the world authority on the Geometers by his long years of concentrated study and was responsible for not only the Palearctic volumes of Seitz on the Family, but also for what had been published in the volumes on the three other faunal sections—American, Indo-Malayan and African.

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Duplicates—*Rhopalocera* from China and Peru, in papers, perfect condition, with data. **Desiderata**—Similar material except from North America.—John W. Moore, 151 Middleton Hall Road, King's Norton, Birmingham, 30.

Desiderata—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.

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Books Wanted.—"Draudt-Seitz Suppt., Vol. III (Noctuae)," English preferred.—A. J. Wightman, "Aurago," Pulborough, Sussex.

Desiderata.—Frohawk, F. W. "Varieties of British Butterflies" (1938). Buckler's British Larvae ('86-'01). For disposal, "Entomologist's Record," complete, Vols. 1-28 hlf. cf., 29-55 wrappers.—A. F. L. Bacon, The Malt House, Burghclere, Newbury.

Wanted for cash or exchange many species of ova, larvae and pupae, including *A. grossulariata* larvae in large numbers. Offers also Tutt's *British Lepidoptera*, vols. 1, 2 and 3; Barrett (small edition), vols. 3, 4, 5 and 6; Tutt's *British Noctua and their Varieties*, vols. 2, 3 and 4.—Pickard, 36 Storeys Way, Cambridge.

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Wanted.—Binocular Microscope, second-hand, for entomological purposes.—E. S. Brown, Hailey Lodge, Hertford Heath, Hertford.

Wanted urgently for experimental purposes, pupae of *betularia*, *porcellus elephantor*.—Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.

Desiderata—*A. alpicola (alpina)*, *H. crinanensis*. **Duplicates**—Many species Noctuae and abs.; or cash.—A. J. Wightman, "Aurago," Pulborough, Sussex.

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MEETINGS OF SOCIETIES.

WAR-TIME ARRANGEMENTS.

Royal Entomological Society of London, 41 Queen's Gate, S.W.7: First Wednesday in the month at 3.30 p.m. *South London Entomological and Natural History Society*, Chapter House Hall, St. Thomas' Street, S.E.1: Second Saturday in the month at 2.0 for 2.30 p.m.; January 27th, Annual Meeting. *London Natural History Society*, London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1: Indoor Meetings, First Tuesdays, 6 to 7.30 p.m.

Communications promised:—T. B. Fletcher, Dr E. A. Cockayne, J. E. Collin, H. Donisthorpe, Dr Malcolm Burr, H. A. Leeds, Prof. J. W. Harrison, Hy. J. Turner, J. R. Whellan, Russell James, P. Siviter Smith, T. Greer, S. Taylor, Capt. C. Q. Parsons, J. F. Bird, Com. G. Harper.

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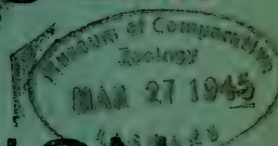
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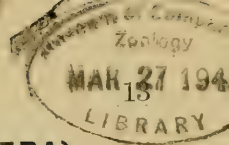
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THE BRITISH SPECIES OF OPOMYZIDAE (DIPTERA).

By J. E. COLLIN, F.R.E.S.

13,820

The Opomyzidae are a small family of Acalyptrate Diptera which always have clouds or spots on some of the wing veins in British species.

Head with only one pair of (reclinate) orbital bristles; no true vibrissae, though sometimes a peristomal bristle below eyes may be mistaken for a vibrissa, such bristle however is some distance behind front margin of mouth opening; third antennal joint at an angle with second; arista pubescent and sometimes with long hairs above only; upper part of occiput excavated and (in British species) without postvertical bristles. Thorax with meso- and sterno-pleurae hairy, and each with one strong bristle; pteropleurae with a few hairs and sometimes a bristle. Wings often long and narrow, subcostal vein short, mediastinal vein ending at a "break" in costa shortly before end of subcostal, there being a short upward projection of the subcostal vein opposite the "break;" second basal and anal cells small; anal vein usually short but distinct; thoracal squamae reduced to a ridge only. Legs with no dorsal preapical bristle to tibiae, and only middle tibiae with a long ventral spur.

The larvae of several species are known to live in the central shoots of grasses and cereals.

There are only two British genera, *Opomyza* with arista only pubescent, scutellum with four almost equally strong marginal bristles and some hairs on disc, and *Geomyza* (formerly *Balioptera*, Lw., v. *Ent. Mon. Mag.*, lxxix, p. 235), with some longer hairs on upper side of arista, basal scutellar bristles small, and disc of scutellum bare. The third European genus *Anomalicheta*, Frey, which may be found in Britain, is distinguished from both the others by the possession of postvertical bristles; it has the scutellum of *Geomyza*, arista of *Opomyza*, and wings each with about ten round, hyaline, spots or patches.

TABLE OF SPECIES OF OPOMYZA, FLN.

- 1 (4). Whole of costal margin of wing, from end of subcostal vein onwards, infuscated.
- 2 (3). Abdomen darkened but with a yellowish basal patch near side margin of each tergite, some of these patches extending to hind margin. Mesolobes (or anal cerci) in male with yellowish hairs only at tip and no minute black spines in male *germinationis*, L.
- 3 (2). Abdomen with a yellow stripe down each side between a dark median stripe and dark side margins. Arista more distinctly pubescent. Mesolobes blunt-ended and clothed there with numerous minute black spines as well as some longer dark hairs
petrei, Mesnil.
- 4 (1). Costal margin not infuscated except near tip of wing.
- 5 (10). Thorax without median dark stripe.
- 6 (9). No clouded supernumerary cross vein, or clouded spot, in first basal cell, between middle cross vein and wing base.
- 7 (8). Cubital vein between middle cross vein and tip of wing sometimes infuscated but without separate cloud spots ... *florum*, F.
- 8 (7). Separate small cloud spots on last section of cubital vein. Prehypopygial tergite of male abdomen (that bearing a pair of bristles at tip) shorter, scarcely so long as previous tergite
punctata, Hal. (*nathaliae*, Egg.).

- 9 (6). Wings with a clouded supernumerary cross vein, or at least a clouded spot, in first basal cell before middle cross vein *punctella*, Fln.
- 10 (5). Thorax with a median dark stripe. Wings narrowed about base and sometimes with indications of a supernumerary cross vein in first basal cell *lineatopunctata*, v. Ros.

O. germinationis, L. This is a common and widely distributed species which breeds in various grasses and cereals.

**O. petrei*, Mesnil. Apparently an overlooked species first described in 1934 (*Rev. France Ent.*, I, 202) and included in a *Monograph of Noxious Insects*, 1936, by Balachowsky and Mesnil. It was bred from larvae feeding in the grass *Anthoxanthum*. I can record its capture in Sussex (Ranscombe), Cambs. (Chippenham), Suffolk (Newmarket), Hants (Lymington), and Perthshire (Rannoch).

O. florum, F. Another common species breeding in grasses and cereals.

O. punctata, Hal. This was first described in 1833 by Haliday (*Ent. Mag.*, I, pp. 150 and 177) as a var. of *florum*, and later (1862) as a new species (*O. nathaliae*) by Egger. It would appear to be a distinct species though very much like a rather small *florum*. I can record it at present only from Essex and Suffolk. Haliday's record was from Holywood, Co. Down.

**O. punctella*, Fln. Typical specimens have a varying number (up to seven) of small round cloud spots on last section of cubital vein. Czerny states that the spots may differ in number on the two wings of a specimen and may even be absent. I have seen only one British specimen which can be referred to this species, a female in the British Museum captured by Mr R. L. Coe at Braemar (Aberdeenshire) towards the end of July 1938, and this has no indication of any cloud spots on the cubital vein of either wing.

O. lineatopunctata, v. Ros. This has been taken freely at Crowborough (Sussex) by Mr F. Jenkinson, and at Barton Moss (Lancs.) by Mr H. Britten, while I have found it in Chippenham Fen (Cambs.).

TABLE OF SPECIES OF GEOMYZA, FLN. (BALIOPTERA, LW.).

- 1 (4). One pre- and only two post-sutural dorsocentral bristles on thorax.
- 2 (3). No distinct long peristomal bristle. Thorax blackish *breviseta*, Cz.
- 3 (2). With a distinct peristomal bristle. Thorax reddish-yellow *hendeli*, Cz.
- 4 (1). One pre- and three post-sutural dorsocentrals.
- 5 (8). Only the outer cross vein and tip of wing clouded (but see under 8 (5)).
- 6 (7). Wings very narrow with apical cloud large and extending below end of discal vein *apicalis*, Mg.
- 7 (6). Wings less narrow with smaller apical cloud extending only slightly below cubital vein. Paralobes of male genitalia excavated at tip so as to end in two blunt points *venusta*, Mg.
- 8 (5). Both cross veins and tip of wing clouded. In cases of doubtful clouding of middle cross vein, subcostal vein longer, so that distance between humeral cross vein and end of subcostal is at

least as long as from this latter to a point opposite middle cross vein, and this latter distance not longer than between middle and outer cross veins.

- 9 (12). Pteropleurae with short hairs only. No distinct darkening of wing below end of subcostal vein.
- 10 (11). Cross veins only narrowly clouded, middle cross vein often only slightly and indistinctly clouded *combinata*, L.
- 11 (10). Cross veins broadly and middle cross vein always very distinctly clouded *majuscula*, Lw.
- 12 (9). Pteropleurae with a distinct long black bristle as well as 1-2 short hairs. A distinct darkening of wing below end of subcostal vein. Cross veins broadly clouded. Thorax and legs variable in colour *tripunctata*, Flin.

Those species with only three pairs of dorsocentral bristles have been placed in a separate genus, *Geomyzella*, by Enderlein (1936). This name would appear to be a synonym of *Mutilloptera*, Coq. (1908), but *G. hendeli* with three dorsocentrals so closely resembles *apicalis* with four such bristles in all other characters, that I agree with Czerny in considering that they do not represent distinct genera.

**G. breviseta*, Cz. A little known species described in 1928 from three specimens taken by Oldenberg near Berlin. It is small and dark with narrow wings having their extreme base and costal margin to end of subcostal vein darkened. Legs yellow with postero-dorsal dark patch on four posterior femora, and hind tibiae extensively darkened. The absence of the usual long peristomal bristle is very distinctive. I caught a female at Worlington (Suffolk) on 19th June 1936.

**G. hendeli*, Cz. Another very little known species described in 1928 from a single female taken by Hendel on the Island of Rügen. It is very small (scarcely 2 mm.) with yellow thorax, but upper part of pleurae and all metanotum below scutellum brownish; abdomen black; antennae very pale yellow; upper part of frons brownish. Legs yellow, but four posterior femora with a faint brownish ring before tip (most evident on hind femora). Wings very narrow and strap-shaped, darkened about base, as far as humeral cross vein. There is a single male in the British Museum taken by Dr F. W. Edwards at Letchworth (Herts.) in July 1917.

G. apicalis, Mg. Differing from *hendeli* mainly by the possession of four pairs of dorsocentral bristles on thorax; it seems however to be a rather larger species with wings not so extremely narrow, but I have seen only one female taken by Mr Verrall at "Burnham" (? Essex) in August 1881.

G. venusta, Mg. I have not seen a British specimen of this species. The two females under this name in the Verrall Collection were immature *combinata*. It seems to be not uncommon on the Continent. Mesnil records it as breeding in grasses of the genus *Bromus* in France. The male genitalia are very distinctive.

G. combinata, L. This and *tripunctata* are the two common British species. For some reason difficult to understand, Mesnil used the name *combinata* for a species very closely resembling *tripunctata*, and described our British *combinata* as a new species, *G. balachowskyi* (1934, *Rev. Franc. Ent.*, I, 197). He found the latter to breed in grasses of the genus

Holcus. It has also been bred from young wheat plants. The paralobes of male genitalia are more pointed than those of *tripunctata*.

**G. majuscula*, Lw. This species, as I understand it, is very much like a rather large *tripunctata*. At present it is known to me from three females only, taken in March at Chippenham and Burwell Fens, and in August at Chippenham Fen (all Cambridgeshire). They cannot be the *combinata* of Mesnil because of the absence of the longer bristle on pteropleura, and of the darkening of wings below end of subcostal vein.

G. tripunctata, Fln. A very common species variable in colour and size. The thorax varies from the usual yellow of most specimens to almost entirely black slightly dusted greyish, and the legs may be extensively darkened. I possess one small male in which the outer cross vein is entirely absent (together with its surrounding dark cloud) from both wings. It breeds in grasses (being especially common in *Lolium*) and in cereals. The species described and figured by Mesnil as *combinata* appears to differ from *tripunctata* only in small details of male genitalia. The paralobes of Mesnil's species more resemble those of *tripunctata* than those of *combinata*, being less pointed than the latter; the inner margin of their broadly rounded end bear a dense row of 15-16 minute black spines compared with the 6-8 more widely and irregularly placed spines of *tripunctata*. Mesnil's specimens were bred from young wheat plants, which are certainly attacked in this country by undoubted *tripunctata* as proved by bred specimens in my collection.

Those species marked with an asterisk (*) are new to the British List.

A GYNANDROMORPH OF OPEROPHTERA BRUMATA, L.

By E. A. COCKAYNE, D.M., F.R.C.P., F.R.E.S.

Mr A. M. Massee kindly sent me a living gynandromorph of *O. brumata*, which he found caught on the sticky band of a fruit tree at the East Malling Research Station, Kent, on 8th November 1943. The right antenna is male and the left female; the right forewing is about 12 mm. long and was probably a normal and fully-expanded male wing before it became covered with sticky material from the band; the right hindwing, 2.25 mm. long, resembles that of a female in shape and has a dark transverse line running across it; the left forewing, 3 mm. long, is also like that of a female; the left hindwing, about 7 mm. long, is very narrow, curves forwards, and has a fringe along the inner margin; the abdomen is not quite as stout as that of a female. Internally there was a bursa copulatrix, two ovaries of equal size, each containing a considerable number of eggs, but fewer than a normal female has; the left cement gland was fully developed, but the right one was absent. The external genitalia were not examined.

No gynandromorph of this species is mentioned in the complete list of Palaearctic gynandromorphs published by Schultz (*Allgem. Z. Ent.*, 1904, 9, 304), but Rudolf Heinrich reports and figures one (*Int. Ent. Z.*, 1927, 20, 203). It has a wing span of 10 mm.; all four wings are unequal in size and shape, those on the right side being more like those of a male than a female and the left hindwing more like that of a female. He was unable to find any previous record of a gynandromorph

of this species. W. Hensel, however (*Ibid.*, 231), says he took one in 1911 with the wings on the right side female and those on the left side male.

A gynandromorph of *O. fagata*, Scharf. (*boreata*, Hb.) is recorded by Michel (*Ent. Z.*, 1936, **49**, 548) with the right antenna male and the left female; the left forewing was male and the other three female.

W. Strehlau (*Int. Ent. Z.*, 1927, **20**, 230) says he bred eight mixed gynandromorphs of *O. fagata* amongst a great number of normal females from larvae taken at Dresden in 1924.

NOTES ON ODONATA, 1942-4.

By J. A. WHELLAN, B.Sc.

Gomphus vulgatissimus, L.—Oxford. By the Thames at Goring—one only; Hereford* and Monmouth; frequent by the Wye about Symond's Yat.

Aeshna grandis, L.—W. Lancs, Marton Mere; S. Lancs, nr. Colne.

Sympetrum striolatum, Charp.—Caern; Llyn Glasfryn; Llyn y Dywarchen; Ystumllyn; Morfa Bychan.

Agrion virgo, L.—Radnor. By a stream near Llandrindod Wells.

A. splendens, Harris.—Hereford and Monmouth*. Plentiful by the Wye at Symond's Yat.

Lestes sponsa, Hanseman.—Caern*; Llyn Glasfryn; Ystumllyn.

Platycnemis pennipes, Pallas.—Hereford* and Monmouth*. Plentiful by the Wye at Symond's Yat. All of the *lactea* form.

Pyrrosoma nymphula, Sulzer.—W. Lancs; Silverdale.

Ischnura elegans, Van der Linden.—W. Lancs. Garstang canal; Marton Mere; Blackpool. S. Lancs. Rufford canal; Lydiate canal. Brecon*. Llangorse Lake. Caern. Ystumllyn; Llyn Glasfryn. This is the commonest dragon-fly in the north-west.

Enallagma cyathigerum, Charp.—W. Lancs. Marton Mere. Caern. Llyn y Dywarchen; Llyn Glasfryn.

Coenagrion puella, L.—W. Lancs. Garstang canal, common.

C. pulchellum, Van der Linden.—W. Suffolk*. By source of Little Ouse.

Palaeobasis tenella, Villers.—Caern. One specimen was caught and subsequently released. No others were seen in spite of long search in the locality, 9th August 1942.

*Where, so far as I am aware, a species has not previously been recorded from a particular county, that county is asterisked.

[It may be pointed out that Symond's Yat is not in Herefordshire, the Wye in this place being bordered by Monmouthshire and Gloucestershire. *G. vulgatissimus*, *A. splendens*, and *P. pennipes* were all recorded from Symond's Yat by D. H. Wild (*Proc. Cottessw. Nat. Field Club*, xxvi, 111: v. 1937).—T.B.F.]

NOTES ON TURKISH DERMAPTERA.

By MALCOLM BURR, D.Sc., F.R.E.S.

Plate I.

Earwigs are by no means common in Turkey and even the offer of cash rewards to gardeners has produced but little result. There is, however, considerable scope for research, as several interesting species occur and others may be anticipated. So little has been recorded about Turkish Dermaptera that the following modest contribution to our knowledge is worth recording.

Students of Turkish tell me that the Turkish name for earwig is *kulagha giren*, or *kulagha chilan*, i.e., the runner-into-the-ear. But this sounds suspiciously like a learned name imposed from above. The Turks are very casual about the application of names to animals and plants, and earwigs are unusual insects here. Still, our maid, a Turkish semi-educated village girl, recognized one that we caught in the house, and knew it as "kulagha chilan."

Earwigs are not familiar insects in the south of Europe, and I have not traced a genuine native word for them in the languages of the Mediterranean.

LABIDURINAE.

Labidura riparia, Pall.—Professor Kosswig showed me a very small apterous female from Armutlu, on the north coast of the Gulf of Ismid, and a specimen from Kars.

In four years spent on the banks of the Bosphorus, I have not come across a specimen, probably because the shores are not sandy. In The Robert College Museum there is a specimen.

LABIINAE.

Labia minor, L.—I have not come across this species on the wing, but with Professor Kosswig found a few under the bark of a rotting palm tree, prone on the ground, which was swarming with Isopoda, Collembola, and Thysanura.

In the University Museum there is a small male of the *inermis* form from Suadiya, on the shores of the Gulf of Ismid.

PSALINAE.

Anisolabis annulipes, Luc.—Professor Kosswig brought back a small series of well developed specimens from Armutlu.

FORFICULINAE.

Anechura bipunctata, Fabr.—E. Taurus: Kaldi Dag, about 8000 ft.; a typical, dark form; brought me by our Consul-General, Mr Hurst. Erciyas, 2500-3500 ft.; three females and several nymphs; one female was teneral; 1st August 1941 (Kosswig). Kars, one male, September 1941 (Kosswig).

Forficula decipiens, Géné.—A single male on an Iris on my dining table near Bebek, on the banks of the Bosphorus, 21st April 1943. Another from a garden in the middle of the village of Rumelihisari, on 2nd June 1943.

F. lurida, Fisch.—Fairly common in the upper part of the village of Rumelihisari, chiefly in gardens. I have the following dates: 22.ix.40, 12.v.41, 7.vi.41, 22.vi.41, from various friends. Armutlu, several (Kosswig). Yaylacik and Pendik (Univ. Mus.).

F. auricularia, L.—Rumelihisari, very dark macrolabious males on 10th and 11th November 1940 and 29th December 1941. 1st December 1940, the Beyoglu, British Embassy garden: 7 males, 21 females; 24th May 1941; 31st October 1942. Robert College Infirmary Garden: 27th June 1941, two macrolabious males and four females. Bebek: 5th July 1944. Baltá Liman, a female in flood jetsam, 5th September 1943. Kars: macrolabious male, September 1941 (Kosswig). Bulu, early August 1941, under stones, about 1600 m., in zone of sub-alpine flora (Dr Post).

The relations of these three species are interesting. It seems that *F. lurida* and *F. auricularia* have defined areas, for in the immediate neighbourhood of the sprawling village of Rumelihisari they do not appear to overlap. The specimens from the north-western gardens, on the highest ground, are *F. lurida*, and those from the lower levels and south-eastern portion are *F. auricularia*, while the scarcer *F. decipiens* seems to overlap with the latter, but not with the former.

The specimens from the Embassy Garden were all found under bark on old posts, and never on Dahlias. They are a recognizable form, much darker and more lightly built than our British form, with the wing scales as dark as the elytra; the forceps are more slender and graceful, and the dilate portion is separated from the tooth by a small concavity, whereas with our British specimens the tooth seems to rise directly out of the corner of the dilated portion. These characteristics give this form a distinctive appearance, but I do not care to name it, as it is very likely only a local environmental form.

I was expecting to find the highly coloured form described by Lucas as *orientalis*, from Levantine specimens, but I have not come across it. A few from the Embassy garden, while having the anterior portion typically dark, had the abdomen much brighter than usual, thus approaching *orientalis*, Luc. This was the case also with the two macrolabious males from the Infirmary Garden. This is at an altitude of about 200 ft., above the Bosphorus. I do not know the altitude of the Embassy garden, but should say it is about half that. The Embassy garden is also much damper. I think it very probably that this intensity of colouring is dependent upon illumination and upon the degree of moisture, as I have noticed is undoubtedly the case with certain highly coloured grasshoppers in Africa.

The relationship of the *F. auricularia* group is also very interesting. It is a case of multiple species.

For while brachypterism in many species of earwig is a merely varietal feature, occurring from no apparent cause and seemingly not connected with distribution, in this group of earwigs it is accepted as a specific character. The only cases of genuine brachypterism in *F. auricularia* that I know of occur in Italy, where it is accepted as a distinct species, *F. silana*, Gén  , apparently replacing the typical form where it occurs. The so-called brachypterism in *F. auricularia* from the Isle of Wight recorded by me about forty years ago may be, I now think, attributed to mutilation by other earwigs, a phenomenon recorded by Worthington.

Similarly, *F. decipiens* is the brachypterous form of *F. lurida*, yet it occurs throughout the Mediterranean, while the macropterous *F. lurida* is known only in the eastern portion.

These two closely related cases of correlation between brachypterism and geography are noteworthy, the only ones that I can recall in either the Dermaptera or Orthoptera.

Again, while *auricularia-silana* form a pair, *lurida-decipiens* form a corresponding pair. The difference between these two pairs is also what would be regarded as a rule as a trifling matter; that is, the presence or absence of a sharp tooth at the corner of the dilated part of the forceps of the males. Normally I should regard small variations of armature as of little or no significance. In such plastic forms as *L. riparia*, for instance, little attention would be paid to them. Yet in this group they are persistent. The central European *auricularia* and its Italian form *silana* invariably has this tooth, while the Mediterranean *lurida-decipiens* never have it.

The four forms are always accepted as good species, yet characters far more striking are not considered specific in *L. riparia*, which is not only excessively plastic but almost cosmopolitan.

Bey-Bienko has recently shown that in the Far East there is a series of what Semenov-Tian-Shansky calls vicarious species, which correspond to the various western forms. How interesting it would be to work out this problem in detail.

F. smyrnensis, Serv.—This handsome earwig is far from common, though generally distributed in the neighbourhood of the Bosphorus.

In the Robert College Museum there is a male from the Forest of Belgrade, and in the collection of the University Museum there are five very fine macrolabious males from the same locality. There is one from Istenya, about three miles up the coast beyond Rumelihisari. Additional localities in the neighbourhood of Istanbul are Florya (4.vii.26), on the Marmora coast, and from Pendik (11.v.29) on the shores of the Gulf of Ismid.

Yet in all my walks abroad I have kept a sharp eye open for this handsome earwig, for I have never come across it alive. I have offered gardeners cash prizes for earwigs, and many of my friends in and around Rumelihisari have saved for me any earwigs they have found in their gardens, but no one has produced a *smyrnensis*.

Nor can it be very common in its type locality. One friend of mine hunted for it in a big garden in Smyrna every day for a week, and promised the gardener a reward if he found one, but in vain. Miss O'Neill, of Robert College, was able to procure only a single specimen after diligent hunting on two visits to Smyrna of several weeks each.

This handsome and very distinctive species must occur throughout Anatolia as far as the Caspian, for Semenov-Tian-Shansky has recognized that his *pomerantsevi* from the Transcaucasus is a synonym. But in two visits to the place where it was taken I failed to find one. The original specimen came to light, but not an earwig is reported to the arc lamp which my host Shelkovnikov kept burning at night on the edge of the steppe, for collecting purposes.

It is the only European member of the group of *Forficula* with pale spotted elytra, comprising the North African *F. lucasi*, Dohrn, and *F. barroisi*, Bol., and a smaller species in South Africa and South India and Ceylon respectively.

COLLECTING NOTES.

ASILUS CRABRONIFORMIS IN 1944.—This large Asilid Fly was less common than usual in 1944 or perhaps was less often observed on account of the dull weather. The first was seen on the wing on 14.viii and I have no further note until 11.ix, when several (4 or 5) were seen resting on half-dry cattle-droppings, as usual: all seemed to be females, but I saw none ovipositing or with prey. On 21.ix (rather a late date) two more were noted on cattle-droppings. That the species was relatively scarce seems confirmed by the absence of remains of its prey, usually found in some numbers on the droppings.—T. BAINBRIGGE FLETCHER, Rodborough, 4.xi.1944.

GRASSHOPPERS IN 1944.—I have few notes, but young Acridids had already hatched out by 2.v, about a fortnight before normal, and adults were seen:—*Myrmeotettix maculatus*, 30.v; *Stenobothrus lineatus*, 12.vi; *Omocestus viridulus*, 13.vi; *Gomphoceris rufus*, ♂, 17.vii. On 21.ix there were still many grasshoppers about and, without looking for them especially, I noted *M. maculatus*, *S. lineatus*, *G. rufus*, *O. viridulus*, *Chortippus bicolor* and *C. parallelus*, and also *Aerydium vittatum* (one very minute nymph and one winged adult).—T. BAINBRIGGE FLETCHER, Rodborough, Glos., 4.xi.1944.

A NEW LOCALITY FOR PHALONIA GILVICOMANA (LEP. PHALONIADAE).—After having resided here since May 1933, it was with rather mixed feelings that on 22.vi.44 I took a worn female of *Phalonia gilvicomana*, disturbed from *Lactuca muralis* plants, then just coming into flower, growing under the wall of my house. Subsequent sweeping amongst *Lactuca* plants disclosed no more, but probably the moth is established here.—T. BAINBRIGGE FLETCHER, Rodborough, Glos., 14.xi.1944.

LOZOPERA BEATRICELLA, WLSM. (LEP. PHALONIADAE).—In 1937 (*Ent. Rec.*, xlix, 101) I recorded *Lozopera beatricella* from Glos. from a specimen bred from a pupa found here in stem of hemlock (*Conium maculatum*). I can now add another capture, of a very worn female, beaten from hemlock in Woodchester Park on 15.vii.44. This is actually the "Furthest West" for this species, which is evidently overlooked in others of our Southern Counties.—T. BAINBRIGGE FLETCHER, Rodborough, Glos., 14.xi.44.

XANTHIA AURAGO.—With reference to Capt. Parson's remarks on *Xanthia aurago*, Fab., flying in the daytime on the outskirts of beech woods as noted by the Rev. H. H. Crewe in Barrett, I may state that it is a common occurrence for this species in the Cotswolds to do so in September on sunny afternoons between 3 and 4 o'clock, especially high up over the roads bordered by beech. Maples are to be found here as undergrowth and on them in May the larvae of this moth are found both in Berks and Gloucester.—C. DONOVAN, Lt.-Col., I.M.S. (Ret.), Bourton-on-the-Water, Glos., 21st December 1944.

HAVING read S. G. Castle Russell's account of the New Forest this summer, I thought the following notes from Dorset might be of interest. My two main collecting sites are Holcombe Wood (some two miles S.W.

from Buckland Newton and on the 700' contour) and Hill Wood (some two miles E.S.E. with a long overgrown ride on the 750' contour). *Euphydryas aurinia* was much more plentiful at the former than in the previous year and I took a ♀ with the hindwings beneath much paler than usual, the yellowish cells being much enlarged at the expense of the other colours. On 30.vii.44 I paid a visit to Hill Wood to see if *Argynnis paphia* was there. There were heavy clouds when I got there but I kicked up a worn ♀ from rough ground before reaching the wood. As I got to the wood I saw some distance off, with wings open, on some bracken, what I thought at first was an overgrown *Pararge aegeria*, but on getting nearer was surprised to see a nice ab. *valesina* ♀, my first acquaintance with this var. On going into the ride in the wood I found several males of *paphia* on the wing and then suddenly saw a short distance off two pairs of *paphia in cop* sitting on a low bramble and only about a foot apart. The time was about 12.45 p.m. D.S.T. About 2 p.m. all gaps in the clouds closed up and no more *paphia* were seen. I had taken 3 ♂ and 3 ♀ including the *valesina*. On 4.vi.44 I had visited Hill Wood and found *Brenthis selene* fairly plentiful, but not easy to capture owing to the brambles which had overrun the ride. Only one worn *B. euphrosyne* was seen on this date. From 16.vii till 28.viii *Heodes phlaeas* was fairly abundant on the way to both woods and on 8.viii I took a lovely *auroradiata*-major ♀ in splendid fresh condition. From 8.x to 15.x.44 in spite of the awful weather I took a series of nearly two dozen of the third brood, only two *phlaeas* having been seen on the wing between the end of August till the fresh brood appeared. *Polyommatus coridon* and *P. bellargus* were both scarce on the down slope near Holcombe Wood, and the whole slope was comparatively bare. Whereas in 1943 it had been a purple sheet of devil's-bit scabious, this season it had only scattered stems of flower, having been badly hit by the earlier draught. *Jurtina* was also much less evident.—ROBERT D. R. TROUP.

REPUTED MIMICRY IN *PARERONIA VALERIA*, CR., CONSIDERED WITH REFERENCE TO OTHER INDO-AUSTRALIAN PIERIDAE.—I have read Mr Richmond Wheeler's paper under the above title (1944, *Entomologist's Record*, 56: 90-93) with particular interest, as some years back Dr A. F. Rosa (1937, *Entomologist*, 70: 32-37) propounded a theory that it was not always necessary for the two members of a pair of Batesian mimics to fly together and that in many cases they were found at the opposite ends of the range of a species of migrant bird. One of the pairs mentioned in support of this theory was the yellow ♀ form *philomela*, F., of *Pareronia valeria*, Cr.; *hippia*, F., from India generally, and *Danaus aspasia*, F., from Malay, Java and Sumatra. In a note opposing this conception (1939, *Entomologist*, 72: 222) I stated that I thought the general Danaine appearance of both forms of the female of *P. valeria* would be ample protection, even in the case of f. *philomela*, from birds unacquainted with *D. aspasia*, and I cannot help thinking that Mr Wheeler has underestimated the very Danaine appearance these insects have in flight. Whilst I am prepared to agree that parallel development can explain similarity in pattern and colour, it does not, in my opinion, account for similarity in flight between the mimetic sex of a species and its model when the non-mimetic sex retains the normal flight of its family. In this case the flight of the two sexes of *P. valeria* is very different—the males have the usual swift Pierid flight, whilst the females have the slow, sail-

ing flight so characteristic of the Danaids. Dr Longstaff, in his *Butterfly Hunting in Many Lands*, records having mistaken the female of *Paretonia ceylanica*, Feld., for *Danaus aglea*, Cr., and my first females of *P. valeria*, Cr., and *hippia*, F., were caught under the impression that they were the same Danaid, and it is only now that I know that the Danaid does not occur in Calcutta that I am no longer misled.

As regards the apparent disparity in the numbers of the sexes, the males are certainly more in evidence in India, but some years ago I had a garden in which a number of *Capparis* bushes were growing and bred a considerable number from larvae found thereon without finding that the males were very much more numerous than the females. I think it is a question of difference in habits. The females of *Papilio polytes*, L., are usually considered rarer than the males, but I had twelve males and eighteen females out of thirty larvae I reared recently.—D. G. SEVASTOPULO, F.R.E.S., Calcutta, 10.xi.44.

THE OCCURRENCE OF PHALERA BUCEPHALA, L., ON RHUM.—In my note in the November number of this Magazine, it quite slipped my memory that I had noted larvae on Rhum in 1937, when, on a voyage from Soay to Eigg, we were driven into Loch Scresort by a violent gale. This fact was duly recorded in my paper on the Lepidoptera of certain Hebridean Islands published in *Proc. Durham Univ. Phil. Soc.*, Vol. xi, Pt. 1, p. 13.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne.

REVIEW.

"THE CUCKOO AND OTHER BIRD MYSTERIES."—By Bernard Acworth. [Eyre & Spottiswoode, 1944]. Entomologists interested in theories of flight and migration in insects should not be misled by the title of this very original book, as both the First and the Second Law of Currents postulated by the author apply to any flying body, bird or insect. Primarily they are bird problems that are discussed, but the majority of these are equally applicable to those of insect flight and no entomologist should fail to study the author's carefully thought-out ideas, which he expounds in an extremely clear and logical manner. As an example of the type of analogy that may be drawn from this book, one of the points discussed is the old argument as to whether a bird can fly with the wind, many having stated that this is impossible as the bird's feathers will be too severely ruffled by the following wind. The author shows this "ruffling" to be impossible, and thereby gives the solution to a similar argument that has been used relative to "immigrant" insects and the worn condition or otherwise of their wings after such flights, some entomologists having maintained that the scales of the wings in such cases would be misplaced. There are many such valuable analogies that will greatly assist in removing a number of wrongly held tenets that at present prejudice consideration of the various types of insect travel. The book is provocative indeed, but the author's points are undeniably cogent and will ultimately greatly influence opinion on the flight of insects, as well as of birds, which latter is the primary object of the book. It is to be hoped that this influence will be felt soon.—P. SIVITER SMITH.

CURRENT NOTES.

SUBSTITUTE FOOD-PLANTS.—I am grateful to Mr Balfour-Browne for his note (1944, 56: 104) drawing attention to the fact that I had failed to include a definition of what I meant by a "substitute food-plant" in my paper on the subject (1944, 56: 74-78).

In the list which I gave, all food-plants, with the exception of the few marked with an asterisk, are what I would call natural food-plants, i.e., those on which I have found either ova or larva of the species in question and on which I have reared it to maturity without excessive mortality, and produced normal sized imagines. The food-plants marked with an asterisk are unnatural ones; they have been accepted by larvae hatched from ova laid in captivity but have obviously been unsuitable, as the mortality was excessive and the few imagines which emerged were stunted and under-sized.—D. G. SEVASTOPULO, F.R.E.S., Calcutta, 16.xii.44.

MR J. SNEYD TAYLOR, of Graaff-Reinet, Cape Province, S. Africa, who for years has been working on the "Prickly Pear" pest in the Karroo area, writes: "I am posting a few Lepidoptera to-day, mostly pretty common stuff I fancy, but perhaps there will be something of interest among them. I have included a few specimens of the "striped hawk," which was named for me some years ago by Janse as *Celerio lineata*, Fb., ssp. *livornica*, Esp. South, I see, names it *Phryxus (Deilephila) livornica*. If you can give me the correct name, I should be very grateful. [*Deilephila lineata*, Fab., ssp. *livornica*, Esp.—Hy. J. T.] There was a wonderful show of *Aloe striata* on the lower slopes of the mountains near the town a couple of months ago. I have never seen such a fine display of this Aloe. The buds and blossoms were heavily infested by the larvae of this moth; I have previously found it feeding on Valerian in gardens, but only occasionally, and never in such numbers.

"We expect to be transferred to Fort Beaufort, about the end of the year, and although it is a pretty little place, and the country of a much more luxuriant type than the Karroo, we shall be very sorry to leave Graaff-Reinet. Ultimately, however, there will be opportunities for work other than that connected with cactus.

"Prickly Pear has ceased to be a problem in the Karroo, thanks to *Dactylopius opuntiae*, which continues to do wonderful work in spite of the Coccinellids. We find that the infested pear, if chopped down close to the ground, soon dies off. It is not so, near the coast; however, where the lady-birds and a fungus disease do not allow the cochineal to make any headway. At Fort Beaufort there is a much richer vegetation, and I am hoping to be able to get you a better variety of moths there. It is about 90 miles by road inland from East London, about fifty from Grahamstown, and is situated at the foot of the Katberg.

"I have been thinking of writing up a list of all the Lepidoptera, and their food-plants, which I have met with in this country. Do you think it would be worth while and of use? It would be better still, of course, if I could get other people interested to co-operate, but whether that would be possible, or not, I do not know.

"The birds continue to occupy much of my spare time, and I am going to miss the dam here very much. Big inflows of water in March and May did not improve it for waders, as land which had been far from the water's edge for years is now covered. I shall find a very different bird fauna at Fort Beaufort."

a series of small black lunules. The hind wings are of a reddish-white with their borders widely shaded with black, the veins and a discal spot grey." Hamp., *Cat. Lep. Ph.*, VI, 330 (1906), "Forewing much darker and variegated with white."—S. Russia.

I am of opinion that the name *pavida*, Bdv., cannot stand. Bdv. in his *Index Methodicus Cat.* of 1840 placed it as being the same as *chardinyi*, of Dup. (1836). Drdt., *Pal. Noct. Supp.* (1934), said there had been no proper description and suggested the type of *pavida* was the figure in Culot, *N. et G.* (1910), as follows:—

DESCRIP.—Drdt.-Stz., *l.c.*—"A smallish unicolored reddish-brown form with delicate markings, all lines without whitish edges, the black basal streak very prominent. On the other hand the conjoining streak between claviform stigma and posterior transverse line is absent." From S. Russia.

Draudt-Stz., *l.c.*, has placed *vulturina*, Frr. (1833), as a syn. of *vulturina* (*ea* in error, see H.-S. Index and plate) (1845), which of course is in error in date. *Ab. baltica*, Hering (1846) is superseded by the *vulturina*, Frr. (1833).

But when we turn to Culot we find his description was from Splr. (*Schm. Eur.*). "Forewings are of a deep colour, not a mixture of reddish-yellow, but only of purple-brown, the stigmata and transverse lines lightened with a grey-white, the subterminal line almost snow-white, as well as the points which accompany the angles." Culot called attention to his figure "which was so carefully drawn as to be precisely the type of *pavida*, Bdv." (p. 151, !!! [*i.e. chardinyi*, Dup.].

f. vulturinea, H.-S., *Bearb. Sys. Noct.*, II, 280 (1850).

FIG.—*l.c.*, 403.

ORIG. DESCRIP.—"Figured from a male example I have obtained from Danzig from Herr Keferstein; I do not consider it essentially different from *adusta*. It has a sandy, iron-grey and purple-red mixed coloration; the claviform inside the waved line is absent, and the reniform has not a trace of light markings; the inner side of the waved line is the brightest purple-red." North Germany.

race *vicina*, Alph., *Hor. Ross.*, XVII, 67 (1882).

ORIG. DESCRIP.—"Mam. *genistae* proxima. Major obscurior; undulata (subterminali) anticarum signo \supseteq multo breviori."

This *Mamestra*, larger than *genistae* (which seldom measures 41 mm.), has altogether the facies markings of it, except the subterminal of the forewings, in which the \supseteq is much less pronounced. The thorax, like the forewings, are of a deeper brown ground and more uniform; the space between the elbowed and subterminal line is brown and not grey, slightly cendré as in *genistae*. One sees near the lower margin, at the base of the forewings, a very black mark, which is absent in all my *genistae*. The darker hindwings have a very prominent central lunule, which *genistae* do not have (or only very feebly expressed). The under-side of the wings are equally duller than in *genistae* and the disco-cellular dots are very apparent on all four wings." Kouldja.

r. septentrionalis, Hoffm., *Stett. e. Ztg.*, LIV, 128 (1893).

ORIG. DESCRIP.—"The form stands near the *ab. baltica*, Hering, but is much smaller and the markings more indistinct. My specimens mea-

sure 33-35 mm. against 40-43 mm. of my ordinary examples of *adusta*." Kunsamoer.

In Hoffmann's article on Finland Lepidoptera.

race *moesta*, Stdgr., *Iris*, X, 335 (1897).

ORIG. DESCIP.—"Two females of this, one 39 mm. in expanse, quite fresh, the other 36 mm., somewhat worn, belong to a smaller, darker form of *adusta*, which, I think, should bear the name, *moesta*. I suspect these females to be the *pavida* of Bdv., which from Russian examples were first described and figured by Duponchel as *chardinyi*, and later it was figured as *pavida* by Herr Schaff.

I do not possess this form from Russia, but only a pair of dark *adusta* from the Alps, which I put to it, from which I marked v. *pavida* in my *Cat.*, 1871 with the note "alis ant. multo obscurior, fere unicoloribus." I see now that Duponchel's first figure of this form as also the later one of H.S. do not show unicolorous dark forewing throughout, the dark very prominent whitish transverse lines (spots) and lighter stigmata, also disagree with the description."

Typical *adusta* are on the average larger than the two females of *moesta*, which have very dark black-brown forewings, on which the only somewhat lighter (not white) and darker markings are less prominent. In most cases too, the toothed, light transverse line before the hind margin and the light outer portion of the reniform stigma are wanting. The hind-wings in the fresh ♀ are in the outer portion widely grey-white, while in the worn ♀ they are less dark, but not brownish as *adusta* is coloured."

Hamps., *Cat. Lep. Ph.*, VI, 329 (1906), "Smaller and darker; forewing blackish."—E. Siberia.

ab. *bathensis*, Lutz., *Ent. Zt.*, XIV, 162 (1901).

ORIG. DESCIP.—"Forewing brown-black, with reddish tinge, which was especially noticeable when held obliquely; all the markings much sharper than in *adusta* and in var. *baltica*. On the costa of the marginal area stand four distinct whitish spots, which in *adusta* and *baltica* are either wholly wanting or are only slightly developed. Orbicular covered with the ground colour only very slightly and finely white marked in many examples without margin; in the reniform only the basal part remains or only the margin itself whitish-yellow; the longitudinal streak in the cell 1b is large, deep black, much stronger than in the typical form and the var. *baltica*; the two transverse lines are evenly darker and much more distinct than in the named species; the sagittate spots are more distinct in all parts; waved line whitish, sharply toothed and always present complete. Between the waved line and the border the colour is the ground colour, not blackish-grey as in *adusta* and *baltica*; only in a few specimens does one find a mixing of whitish scales. Hindwings white-grey, on the border black-grey; the central dot stands out distinctly; often two dark-curved lines and before the margin also a tolerably broad white waved line. Thorax colour of the forewing: body often grey, but on the sides and below much stronger red than in *adusta* and *baltica*."

ab. *aterrima*, Constanti, *Att. Soc. Nat. Modana* (5), III, 15 (1916) [Seitz, *Pal. Noct. Supp.*, III, 139 (1934)].

DESCRIP.—“ A small form, body and forewings deep black and highly glossy, hind-wings dusky at margin.” Mt. Gibbie.

r. *carpathica* Kauchi, *Pol. Pis. Ent.*, I, 39 (1922).

ORIG. DESCRIP.—“ Multo obscurior, signaturis typicis.” Poland.

ab. *ochrea*, Lenz., *Osth. Schm. Sudbay.*, II (2), 331 (1927).

ORIG. DESCRIP.—“ Brightened with ochre-yellowish particularly in the outer margin.”

ssp. *juldussica*, (A.B.-H.), *Drdt.-Stz., Pal. Noct. Supp.*, III, 139 (1934).

ORIG. DESCRIP.—“ Especially protracted apices of forewings with more oblique margins. They are somewhat paler blackish-grey with a violet sheen in ground colour, very delicately marked, with transverse streak and very clear but fine white subterminal line without any trace of black cuneiform marks anteriorly. Hindwings very pale whitish with dark crescent at end of cell, post-medial and marginal bands.” Juldus and Arasagungol.

ssp. *lappona*, Rang., *Ent. Rund.*, LII, 233 (1935).

ORIG. DESCRIP.—“ Small. Only 35 mm. in expanse. Forewing normally marked, but on the whole darker while the hindwings are much paler as in *adusta*.

ab. *albilinea*, Hoffm. & Knud., *Danske Storsom.*, III, p. 310 (1938).

FIG.—l.c., plt. VI, 21.

ORIG. DESCRIP.—“ A small specimen, with prominent, wider, whiter waved line.” Bulbjerg, Denmark.

Hadena, Ochs.-Tr. (1816-25), Dup., Gn., Newman [*Polia*, Ochs.-Tr. (1816-25), Meyr., Meyr.: *Eumichtis*, Hb. (1821), Hamp., Sth.: *Crino*, Hb. 1821), invalid: *Dryobota*, Led. (1857), Barr., Stdgr., Splr., Warr.-Stz., Culot] *protea*, (Bork.), Esp.

Tutt, *Brit. Noct.*, III, 76 (1892): Meyr., *Handb.*, 53 (1895): Barr., *Lep. Br. Is.*, IV, 312, plt. 171, 1 (1897): Stdgr., *Cat.*, III, ed., 182 (1901): Splr., *Schm. Eur.*, I, 206, plt. 39, 3 (1905): Hamp., *Lep. Phal.*, VI, 339, fig. 109 (1906): South, *M.B.I.*, I, 261, plt. 122, f. 6-7 (1907): Warr.-Stz., *Pal. Noct.*, III, 134, plt. 32h, i, plt. 33a (1910): Culot, *N. et G.*, I (1), 106, plt. 36, f. 6-7 (1911): Meyr., *Rev. Handb.*, 134 (1928).

Schiff., *Verz.*, 84, p. 8 (1775), referred to a larva feeding on *Quercus cerris*, the “Zerreicheneule” (the small destructive caterpillar of the *cerris* oak)??

Esper, *Abbild. Noct.*, IV, 494, plt. 150 (71), fig. 6 (1790+?), gave a very rough figure with the name *protea*. Wernb. agrees, and cites Schiff.’s *Verz.* for priority.

Ernst & Engram., *Pap. d’Eur.*, VI, 19, f. 292 (1788), gave good varied figures of this species which they noted did not occur in Vienna.

Bork., *Scriba’s Beitr.*, III, 199, plt. xiii, f. 3 (1793), gave an excellent figure of *protea* under the name *thalassina* which in his *Naturg.* he corrected to *protea*.

Bork., *Naturl. Noct.*, IV, 386 (1792), when he described this species gave two previous references, viz., to Schiff. and to Scriba. (Issued later than 1792?)

Hb., *Samml. Noct.*, 406 (1808), gave a good figure of the variegated typical form, except that it shows but little, if any, green. The Text, p. 189, reads "Greenish-grey: the forewings pale green spotted and streaked, its reniform rusty but the rest of the usual markings markedly irregular and variable; the hindwings whitish-grey, banded pale grey, the effect is a shiny surface." "It is the *protea* of the Verz."

Haw., *Lep. Brit.*, II, 199 (1809), described this species under the name *seladonia*, but said it was the *protea*, Hb. He gave a form B. of it as "Omino pallidior et pulchrior; maxime tenuiore, stigmatibus tribus, fasciaque apicis albidis; strigaeque alba posticarum in qua ordo punctiorum fuscorum."

Treit., *Schmett.*, V (1), 362 (1825), cited Esper for *protea*, a reference not given by Bork. Treit. said that Esper doubted if Bork. had true *protea* before him. Esper probably took *protea* in his neighbourhood, but it had never occurred near Vienna.

Dup., *Hist. Nat.*, VI, 259, plt. 89, 2-3 (1826), gave figures of two different forms: 2 with light submarginal band and basal area, and 3 a mottled form. He gave Esp. as the author.

Guen., *Hist. Nat.*, VI, 89 (1852), remarked on the variation being so unstable as to prevent the naming of definite recurrent forms.

Newman, *Brit. Moths*, 413 (1869), gave three very good varied b. and w. figures of *protea*.

Barrett, *l.c.*, plt. 171, gave five figures, not one of which is satisfactory. The text says, "The green ground is usually either of a rather dark green or some shade between this and greenish white or pale reddish green." Not one of the figures depicts these shades. They are all dominated by dark yellow or olive coloration. 1b, ♀, is darker marked with very dark hindwing margin; 1c, is more uniformly yellow with paucity of marking; 1d, has much more and lighter areas than normal forms.

Splr., *Schmett. Eur.*, I, 206, plt. 39, f. 3 (1905), gave a very good figure of an average form. He included 2 forms, *variegata*, Tutt, and *suffusa*, Tutt.

Hamp., *Lep. Phal. Noct.*, VI, 339, f. 109 (1906), gave a good b. and w. figure. He referred to the *seladonia*, Haw., but cited Fab., *Ent. Syst.*, III, for it, and Stephens *Ill.*, III.

South, *M.B.I.*, I, 261, plt. 122, 11-12 (1907), gave two very good figures as regards shape, size, marking, but of course the green has not been seen to advantage.

Warr.-Stz., *Pal. Noct.*, III, 134, plt. 32h, i, 33a (1910), gave 8 very good varied figures—h, i, typical ♂ and ♀; ab. *variegata*, ♂ and ♀; ab. *grisea*, ♂ and ♀; ab. *incolorata*, and ab. *dejecta* on plt. 33a. The last three were new forms. He gave Esp. as the prior author.

Culot, *N. et G.*, I (1), 106, plt. 36, f. 6-7, gave two very good figures, a lighter and a darker. Again the green of the description is not much in evidence.

Variation according to Barrett:—

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F.R.C.P.

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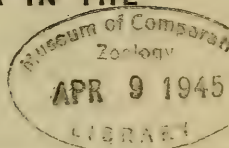
RUMELIHISARI ON THE BOSPHORUS.

The tower in the background is KARA KULA, the Black Tower, used formerly as a pretty grim dungeon.

To face page 18.

FURTHER OBSERVATIONS ON THE GENUS ZYGAENA IN THE INNER AND OUTER HEBRIDES.

By J. W. HESLOP-HARRISON, D.Sc., F.R.S.



13,820

Some time ago, in December 1940 (not December 1944 as incorrectly stated by J. L. Campbell in the November number of the *Entomologist*), there appeared in this Magazine an article from my pen supplying distributional and other information concerning the genus *Zygaena* in the Scottish Western Islands. Since those notes were written, our researches have proceeded, with the result that considerable additions have been made to our knowledge; these it is proposed to place on record now.

Zygaena filipendulae, L.—In dealing with this species in our original article, attention was drawn to the fact that everywhere in the Western Isles this species appears much earlier than in Great Britain, even in southern English localities, as a comparison of the following dates with those supplied by Tutt (*British Lepidoptera*, Vol. 1, pp. 528-530) will demonstrate: Isle of Coll, May 27th; Isle of Gunna, June 6th; Isle of Muck and the adjacent Eilean nan, Each, May 29th-June 2nd; Isle of Eigg, June 4th; Isle of Raasay, first week in June. There can be no doubt but that the earliness of these dates depends upon the positions of the winter isotherms in the islands involved, which are of the same order as those of the south-west of England. However, it should be made clear that the species lingers toward the end of July, but disappears before its maximum numbers are flying on the east coast and elsewhere on the mainland. Notwithstanding these observations, emphasis should be laid on the fact that, precisely as Tutt (*l.c.*) indicates, the average period of emergence of *Z. filipendulae*, whilst overlapping that of *Z. purpuralis*, is undoubtedly much more prolonged.

In all cases, except in the Isle of Berneray (Harris, Outer Hebrides), the forms need no special comment except that the heavy percentage of captures of ab. *cytisi*, Hb., everywhere seems worthy of mention. We hope to give the Berneray colony special study later.

In our *filipendulae* studies, advantage was taken of our material to fill one blank in our knowledge. In no instance, apparently, in *Zygaena* species is the chromosome number known. To fill the gap, full-grown larvae were collected and the gonads dissected out. From these suitable microscope preparations were made which provided large numbers of excellent equatorial plates. These supplied critical counts which demonstrated that the chromosome complement of *Z. filipendulae* was based on a haploid number of $n = 31$, a figure characteristic of so many species of Lepidoptera.

Zygaena purpuralis, L.—Although repeated investigations have been undertaken, we have been unable to extend the known range of this species on Rhum; this, as far as we are aware, covers by far the greater part of all ecologically satisfactory areas on the igneous rocks, but fails to reach the Torridonean strata represented by red sandstones and shales lying north of the lines marked off by the Kilmory and Kinloch Burns.

Campbell (*l.c.*) purports to supply a new Rhum station, Sgorr Reidh,

but only manages to do so by applying a long-disused Gaelic name to one of our original habitats.

Our earliest dates for the emergence of *Z. purpuralis* in the Hebrides are June 6th on the Isle of Gunna, and the second week in June for the Isles of Eigg and Rhum; these are in complete agreement with the dates June 8th given by Tutt for Abersoch, North Wales, and the middle of June supplied by the same writer for western Irish localities. It continues to fly until well into July, and vanishes for the season long before its congener, *Z. filipendulae*.

Meyrick gives the wing expanse of *Z. purpuralis* as 29-34 mm.; against this, my series of Abersoch insects, which comprises 14 individuals, yields a range of 27-30 mm., but these measurements, in view of the small number of individuals concerned, may not be significant. Sets from Rhum and Eigg, which agree in variation spread, exhibit a range of 27-34 mm. in their wing expanse.

Further, Rhum and Eigg specimens fall in line in respect to their general facies, and differ as a group from Abersoch insects in having the red streaks on the forewings less in area, more sharply defined in outline, and the middle blotch displaying less tendency to "overflow" terminally. In my Abersoch specimens, too, although the difference may be more apparent than real, the wings appear more diaphanous and the colour not so bright. As a result of the variation just noted, quite a number of Rhum and Eigg origin fall within the limits of the ab. *interrupta* of Staudinger.

In our original publication, referring to this species, and basing our prediction on well-recognized zoogeographical principles, we stated that we felt "reasonably certain that, if we could get to Muck, Canna, and the southern members of the Outer Island chain in late June, we could demonstrate its presence there." In spite of Campbell's recent pronouncement that "there is no reason for supposing that this species occurs on Barra," we see not the slightest reason for withdrawing our forecast; the basis of his remarks is quite inadequate. He simply makes the *ex parte* statement that despite this island's having been well searched for several years, no Zygaenid other than *filipendulae* has been found there. In a letter (3/3/41) addressed to us, he becomes more explicit and informs us that, in search of Zygaenids, he "made a very careful examination of Barra in 1936 and 1937." In other words, the "several years" boils down to two only, and these two *prior to the date of the discovery of Z. purpuralis in the Hebrides*. Moreover, we venture to doubt the "very careful" nature of the "examination"; it only resulted in Campbell's being able (*Scott. Nat.*, November-December 1938) to give one locality, Ben Erival (July and August, 1936), for *Zygaena filipendulae* on Barra! In contrast to this, we can supply over a dozen Barra stations, with the addition of many others on Fuday, Fiaray, Vatersay, Sandray, Flodday (off Sandray), and Muldoanich. If he missed all these *filipendulae* colonies, then any chance of his detecting the earlier *Z. purpuralis* must indeed be remote. Furthermore, he appears to be quite oblivious of the fact that the ecological requirements of the two insects are very far from identical.

Again, in the *Entomologist* note, he refers to his having liberated couples from the Rhum colony on Canna, and makes the remark that

although he has never seen *Z. purpuralis* on Canna, it may occur there in future. Against this extremely reprehensible action of transplanting critical insects we wish to enter a vigorous protest. On account of the remarkable distribution of *Z. purpuralis* it has been used as a zoogeographical indicator of the greatest possible value. Now, not only has Campbell destroyed any possibility of our testing out our prediction, but, in addition, he has completely invalidated zoogeographical deductions derived from any future occurrence of *Z. purpuralis* on the Isle of Canna.

In giving details of his transplantation "experiments," Campbell mentions that the foodplants of *Z. purpuralis* are plentiful on Canna. The importance of this statement may easily escape notice. Everywhere on Rhum the foodplant of the larva is invariably thyme. Are we to understand that he has experimented with Rhum larvae and discovered that they will eat the various reputed foodplants to which reference is made in the literature? His note would seem to indicate that he has done so. Against this, we can assert emphatically that we have placed *purpuralis* larvae on Lotus, Trifolium, Pimpinella, etc., and never at any time has one of them accepted these plants. Our only success in providing a substitute foodplant was secured when we managed to get wild larvae to take garden mint.

As we have provided the chromosome number of *Z. filipendulae*, we must point out that suitable preparations made from the testes of wild male larvae of *Z. purpuralis* have yielded a chromosome number of $n = 30$. The discrepancy between the figures given for *Z. purpuralis* and *Z. filipendulae* is worthy of special emphasis.

Z. achilleae, Esp.—In this case we have little to augment our former notes, for we have not taken the insect during the last five years. However, as we are in a position to give its chromosome complement, we do so. The number in question is $n = 31$, and this coincides with that of *Z. filipendulae*.

LASIOCAMPA QUERCUS, L. ♂ AB. FEMINICOLORATA, AB. NOV.

By E. A. COCKAYNE, D.M., F.R.C.P.

Wilhelm Niepelt (*Ent. Z.*, 1907, **21**, 107) gave the name *feminicolorata* to a male form of *Lasiocampa quercus*, which resembles the female in colour, founding it on four males from North Bohemia. He referred to a male with female coloration recorded by Frings (*Soc. Ent.*, 1907, **21**, 180), which was taken in July 1906 at Fürth in Bavaria, and to several isolated specimens which he (Niepelt) had received during the preceding 25 years. He also said that M. Wiskott, of Breslau, had told him that in Breslau similar specimens had been bred from larvae fed on sloe and cherry blossom.

Later Niepelt withdrew the name (*Int. Ent. Z.*, 1911, **5**, 186), having discovered that his moths had been produced artificially by Tschinkel, of Steinschönau, North Bohemia, from whom he had received them all together in October 1906.

I asked Fleet Paymaster T. Bainbrigge Fletcher for his opinion on the nomenclature. He says that the name *feminicolorata* is invalid,

having been based on factitious material. The fact that Niepelt withdrew it is beside the point, because an author has no more right to withdraw a name than anyone else, subject to the ordinary etiquette of calling a living author's attention to an error (e.g., a praeoccupied name). Niepelt's name, being invalid, has no standing whatever, and hence no power of praeoccupation. He cites Banks and Caudell, The Entomological Code (1912) § 7. "Names based on hypothetical insects or on a composite specimen are invalid," and says that, although Niepelt's name does not fulfil either of these conditions, the case is very similar.

Genuine males of *L. quercus* with female coloration do occur, and it is probable that the specimen recorded by Frings and those mentioned by Wiskott were not artefacts.

I asked what effect this would have on the validity of Niepelt's name and received the following answer. The case of Wiskott's specimens does not arise. Niepelt's name was made definitely from "4 ♂♂. Coll. Niepelt. Patria: Nord-Böhmen.," which were four of the six bleached specimens received from Tschinkel. The genuine specimens are still unnamed, and to avoid confusion I propose to follow Fleet Paymaster Bainbrigge Fletcher's advice and name them ab. *feminicolorata*.

Lasiocampa quercus L. ♂ ab. **feminicolorata**, ab. nov. The wings and all other parts, which in the normal male are dark brown, are ochreous as in the normal female; the transverse bands are paler and yellower, the discal spot is white, and the antennae are brown. Type. Male. Carnforth, Lancashire. Bred 1896. H. Murray, ex Massey collection.

I have a second male in my collection from the same source with the same data. Both belong to the race *callunae*, Palmer. In the British Museum, Tring, there is a bred specimen from the New Forest, and a damaged one, paler and less ochreous, labelled "Figured Private Drawings," which I believe indicates that it came from the Capper collection.

COLEOPTERA AT LAMPTON, MIDDLESEX.

By HORACE DONISTHORPE, F.Z.S., F.R.E.S., etc.

Within three minutes' walk from my house there is an uncultivated patch of ground, some three to four acres in extent, which has proved to be a first-class place for collecting. Many wild flowers, plants and grasses grow there, and all sorts of trees and bushes. It is surrounded by hawthorn and other hedges, and part of it is used as a "dump" by the Local Borough Council. The people from the gardens and allotments nearby also dump their vegetable refuse there. The sweeping is very good, especially in the grassy hollows. In the town dump house-crickets (*Gryllulus domesticus*) are abundant, and the cockroach (*Blatta orientalis*) is also present. The little ant (*Ponera punctatissima*, usually found indoors) is to be found both in the dump and the vegetable refuse heaps, being plentiful in the latter, as is also the beetle *Anthicus tobias*, Mars. Several specimens of a large woodlouse (*Porcellio dilatatus*, Brandt, kindly named for me by Dr Gordon) have occurred in

the vegetable heaps. I have never seen it alive before, and Middlesex is a new county record.

Of the more notable beetles one must mention *Amara anthobia*, Vilna, not a new county record, however. *Amara nitida*, Strm., a very pleasing capture. There is an old record from Bath, and Blatch took a certain number of specimens at Knowle, near Birmingham. *Aleochara crassicornis*, Boisd.; the only other British record, I believe, is my own, in fungus in Windsor Forest. *A. crassicornis* is very like a small *A. fuscipes*, F., but the antennae are not so transverse, the puncturation is not so strong, and the sides of the red elytra are blackish. *Falagria concinna*, Er.: this species was, of course, new to Britain; I have already recorded it elsewhere, *Scopaeus abbreviatus*, Rey et Muls.: this was first taken in Britain by the late Miss F. J. Kirk, T. H. Edmonds, and the writer at Hallsands, S. Devon. The Lampton specimen agrees exactly with the Devonshire ones. *Atomaria lewisi*, Reitt.: as far as I know, this Japanese species has only been taken before by Mr A. A. Allen in a rubbish heap in his garden at Blackheath. *Atomaria cognata*, Er.? A small species of an *Atomaria* was very common in the vegetable refuse heaps. I took it to be *A. ruficornis*, Marsh. I only set a couple of specimens (♂ and ♀). On comparison it proved not to be *ruficornis*, and I ran it down in Ganglbauer as *cognata*, Er. I hope to take it again next year and definitely bring it forward as British. *Phyllotreta hintoni*, Donis.: a scarce species new to science. *Aphthona aeneomicans*, Allard, also scarce and new to the British list. *Magdalis carbonaria*, L.: this species is a new county record; it probably came off one of the small scattered birch trees. The only other southern record I know of is Crowthorne, Berks., where I beat a specimen off birch years ago.

The complete list is as follows, and is practically the result of twelve months' collecting (the nomenclature is that of the Beare and Donisthorpe *Catalogue*):—CARABIDAE—*Bradycellus verbasci*, Duft., *B. harpalinus*, Dj., both evening sweeping; *Harpalus puncticollis*, Pk., sweeping umbels, etc.; *H. ruficornis*, F., *H. aeneus*, F., *H. rubripes*, Duft., *Pterostichus madidus*, F., all under stones; *Amara anthobia*, Vilna., under stones and in vegetable refuse; *A. convexiuscula*, Marsh., sweeping; *A. nitida*, Strm., *A. familiaris*, Duft., *A. trivialis*, Gyll., all three in vegetable refuse; *Calathus melanocephalus*, L., *Olisthopus rotundatus*, Pk., both under stones; *Dromius linearis*, Ol., *D. melanocephalus*, Dj., both sweeping; *Blechrus maurus*, Strm., *Metabletus foveola*, Gyll., both in vegetable refuse.

(To be continued.)

MOTHS AT A SEARCHLIGHT.

By CLIFFORD CRAUFURD.

On the night of Sunday, 17th September, when leaving my house on the Herts-Essex border, I noticed a large number of objects flying in the beam of a searchlight stationed some three hundred yards away. Several people were standing in the road watching the light, and various opinions were expressed about the objects I had noticed, some asserting that they were birds, others being of opinion that they were bats.

I suspected they were moths, but they seemed so large and were so high up that at first I was doubtful. Accordingly, I went up to the searchlight (I was in uniform) and soon discovered that the objects were indeed moths and in enormous quantity. The crew of the searchlight told me that the beam had a range of several miles and that moths were flying about three-quarters of the way up what they called the "apparent length of the beam."

I estimated that some of the moths were flying between 2000 and 3000 feet up. The only species that could be identified with any certainty at that height was *Phlogophora meticulosa*, as their yellow undersides were very conspicuous. One would naturally have thought that so small a moth would have been invisible at such a height; but although the moths within about 30 feet of one's head, when standing immediately below the light, appeared to be of normal size, as the distance increased they also appeared to increase in size until, at the maximum height I have indicated, *P. meticulosa* seemed to have about three times its usual span. A quarter of a mile away from the beam the sight was very beautiful, the moths dancing in and out and up and down the beam. They were easily visible more than half a mile away, and I have no doubt that on that Sunday night other searchlight units were having a similar experience.

I went home and collected all the boxes I could lay my hands on, and then went back to the searchlight. Soon my boxes were full, and, being more anxious to identify species than to secure cabinet specimens, I crammed as many into each box as I could. A list of these is given at the end of this article. *P. meticulosa* was easily the most abundant species; *Plusia gamma* came next (about 30% I should estimate), and then *Amathes c-nigrum* (about 5%). The "Sallow" moths made up a good proportion of the remainder, which were chiefly *Trifinae*. Very few *Geometridae* were seen.

The height at which the three above-mentioned species, *P. meticulosa*, *P. gamma*, and *A. c-nigrum*, were flying seems to me to be of considerable interest, as we know so little about the height at which migrating moths travel. In his book, *Talking of Moths* (p. 26), Mr Allan remarks: "A great many of the *Noctuae* which we find at our sugar have crossed the sea," and in this district *P. meticulosa* and *A. c-nigrum* in some years occur in such profusion as can only be accounted for by an influx from the Continent.

The moths were not only flying in the beam; they covered the glass and were dancing about on it in hundreds. Some winged their way slowly to and fro; others flew at a great pace, settling on one's head or face or clothes as well as on the metalwork, canvas, and woodwork on or about the apparatus. They were on the cinders under the light and on the surrounding grass in immense numbers.

Next morning I visited the searchlight again and received from its crew a large boxful of moths, mostly dead or burnt. The soldier cleaning the lens told me that he had taken two large moths, and presently produced an empty salmon tin containing a male and female *Herse convolvuli*, both unhappily somewhat the worse for wear—and salmon débris. However, one must not look a gift moth in the mouth. The female was kept for eggs, but although provided with palatial quarters

containing honey and fresh leaves and flowers of *Convolvulus arvensis*, she refused to oblige me. A search on the grass surrounding the light produced two *Arenostola lutosa*.

I visited the searchlight again on Tuesday, the 19th, when a few moths only appeared, among them more *A. lutosa*; on Wednesday, 20th, there was a light drizzle and again only a few moths. On Thursday, 21st, the light was working for only a short time, and nothing was bagged. On Friday, 22nd, thin rain was falling while the light was on, but it was a good night for moths. On this evening a female *H. convolvuli* was taken on the glass, and later a visiting officer handed me a very good male of this species, also taken off the glass. Next morning, the 23rd, the soldier cleaning the apparatus produced a box containing another male in fine condition. I also obtained several more *A. lutosa*. This was the last opportunity I had of visiting the searchlight.

I noticed that if the light was on early in the evening and for only about 20 minutes very few moths were found next morning; but if the light was working for some hours a very large number could be found on the grass and on the apparatus the following morning. The various species each seemed to have their particular spells of flight, and if the spell was exceeded while the light was on they settled and remained where they settled until the following evening. When it was raining a great many of the moths settled on the glass and woodwork, often on their backs, when they would slew round and round on the wet surface, to the damage of wings and thoraces, thereby sometimes making identification difficult.

Large numbers of hornets (*Vespa crabro*, L.) came to the light each night, especially on Friday, the 22nd. I counted about 200 dead, dying or comatose on Saturday morning, the 23rd, which was rather chilly. Ichneumon flies, *Tipulae* and many other Hymenoptera and Diptera were at the light each night; one evening two bats came to the feast, and once a Little Owl settled on the framework and sat there for some time.

It remains to add that the second female *H. convolvuli* taken laid 48 eggs, some of which have already hatched. From a *Lampra fimbria* 250 eggs were obtained, and eleven from a battered *Deuteronomos fuscantaria*.

SPECIES TAKEN.

Herse convolvuli (5). *Trichiura crataegi* (1). *Phragmatobia fuliginosa* (a few). *Agrotis ipsilon* (5). *Peridroma saucia* (1). *Amathes c-nigrum* (a few hundreds). *Triphaena comes* (several). *T. pronuba* (several). *Lampra fimbria* (several). *Eumichtis protea* (several). *Aporophyla lutulenta* (1). *Antitype flavicincta* (4). *Phlogophora meticulosa* (a few thousands). *Hydraecia micacea* (2). *Arenostola lutosa* (10). *Leucania pallens* (many). *Amphipyra tragopogonis* (many). *Atethmia xerampelina* (1). *Omphaloscelis lunosa* (a few). *Agrochola lychnidis* (several). *Anchoscelis litura* (several). *Tiliacea aurago* (4). *Cirrhia icteritia* (several). *C. gilvago* (several). *Conistra vaccinii* (several). *C. ligula* (several). *Scoliopteryx libatrix* (a few). *Plusia gamma* (many hundreds). *Catocala nupta* (a few). *Deuteronomos fuscantaria* (several). *Chiasmia clathrata* (1).

COLLECTING NOTES.

ZEUZERA PYRINA IN S. WALES.—I saw in South's *Moths of the British Isles*, that the "Leopard Moth" (*Z. pyrina*) had been recorded from Cardiff, S. Wales. Is it unusual or worth recording that I took one in 1938 (♀) at Pontypool, Monmouthshire, in my garden? Unfortunately, that was at the beginning of my interest in Lepidoptera, and the specimen was destroyed. I also took a female freshly emerged at Newnham, Gloucestershire, in 1940, which I still have. If either of these facts is worth recording, could you put it in the *Entomologist's Record*? I am very sorry to have written so late, but perhaps it will be in time for the March issue.—M. P. SIDDON, Oldham's Hall, The Schools, Shrewsbury.

[The late C. G. Barrett, whose business peregrinations took him to all parts of the country, where he got in touch with the local collectors, described the distribution of *Z. pyrina* as follows:—"It seems to be found occasionally in all the southern counties, though recorded as rare in Devon and Somerset and even in Sussex. Also found in Norfolk and Suffolk, Staffordshire, Leicestershire and Herefordshire; more commonly in Cambridgeshire; uncommon in Gloucestershire, scarce in Yorkshire and recorded but once in Cheshire. It seems to have been met with from time to time in every square and park in London and probably every garden in the suburbs and occasionally becomes abundant."—HY. J. T.

HELOMYZA VARIEGATA, LW. (DIPTERA), BREEDING IN ROOTS OF SEA-ASTER?—Among the contents of a box of Diptera collected by Mr S. Wakely, and given to me for identification were four ♀♀ of a Helomyzid that I ran down as slightly immature specimens of *H. variegata*, Lw., as they agreed well with the description given in Collin's synopsis of "The British Species of Helomyzidae" [*E.M.M.*, Vol. lxxix, pp. 234-251, October-November 1943]. In that synopsis, however, *variegata* is said to have been bred from "a tree fungus," whereas Wakely's specimens were labelled "South Benfleet: Bred: *Aster tripolium*, L." I wrote to Mr Wakely asking for further details and he replied that the roots were collected on 19th March 1944; the dead portions cut off; and the living portions, in which lepidopterous larvae were feeding—and which were showing tiny sprouts, planted in a flower pot, sunk several inches in the soil and left uncovered till early June. Several dozen larvae of a *Bucculatrix* appeared in the leaves and spun up, producing eventually a good series of specimens, also a number of *Phalonia affinitana* presumably from the root-feeding larvae. The flies appeared on 16th June. I sent the flies and Mr Wakely's letter to Mr Collin, who confirmed my identification, and suggested that the facts be put on record; hence this note.

As Mr Wakely also said in his letter that he did not notice any signs of dipterous larvae or pupae in the roots, and as any subsequent investigation was not possible owing to a "bombing incident" on 2nd July, which unfortunately involved Mr Wakely's house as well as the flower pot, it will be seen that there is no actual proof that the flies were bred from these roots, but the circumstantial evidence strongly points to that being the case. On the other hand, there is the previous record of this species having been bred from a tree-fungus, and the fact that some

other species of *Helomyza* are known to be fungus feeders in their larval stages.

It is to be hoped that during the coming season such dipterists as have access to localities where the sea-aster occurs should endeavour to confirm the breeding habits of this species.—H. W. ANDREWS.

VOLUCELLA INANIS, L., IN THE LONDON DISTRICT.—Another fly in Mr Wakely's box was a ♀ specimen of this handsome Syrphid, taken on 23rd August 1943, in his garden at South Norwood, S.E.25. Although this species seems to be extending its range, I do not think it has been previously taken inside the London Postal area.—H. W. A.

N. KENT RECORDS OF *HELOMYZA*, FLN. (SENSU STRICTO).—When looking up Mr Wakely's specimen of *H. variegata*, referred to above, I took occasion to revise my own series of the species of this genus with the aid of Collin's synopsis and can add North Kent, as a locality for the following species:—*variegata*, Lw.; *notata* var. *hilaris*, Ztt.; *inornata*, Lw.; *affinis*, Mg.; *ustulata*, Mg.; *bicolor*, Ztt.; and *fuscicornis*, Ztt.—H. W. A.

CORANUS SUBAPTERUS, DE GEER, IN GLOS.—It was only in 1944 that this Reduviid Bug was recorded as an addition to the List of Gloucestershire Hemiptera-Heteroptera by Mr Airy Shaw (*E.M.M.*, lxxx, 18: 22.i.1944)—which is one more proof of the paucity of collecting in this County. In 1944, when searching for other insects, I found that *C. subapterus* is quite common on Rodborough Hill. In mid-June many nymphs, in the prae-imaginal instar, were found moving about in the open quite actively in full sunshine, and on 27.vii.44 I noticed the first adults, a pair *in cop.*, and thereafter to the end of August adults were found quite commonly, in September in smaller numbers, the last (a male) being noted on 2.x. All the males seen were brachypterous, although in a very few cases the wings were a little longer than normal. On 17.viii I came across a female which had a *Myrmica scabrinodis* worker so firmly affixed on its rostrum that the Ant-prey was not dropped when the bug was boxed, although it was detached later on when in the box: that was the only occasion on which I saw a *Coranus* feeding naturally. In confinement, the nymphs and adults will feed readily on almost any suitable food that is given to them—freshly-killed Flies and Spiders, small Lepidopterous larvae, Ants' larvae and pupae, etc.

Kirby and Spence (*Introd. Ent.*, II, 387) state that this bug "when taken, emits a sharp sound, probably with its rostrum, by moving its head up and down" and quote "De Geer, iii, 289." I have seen captive nymphs move the tip of the rostrum up and down in a groove below the thorax, but no noise was audible to me, nor have I ever heard a sound emitted by any of the numerous adults which I have handled. Some individuals, of either sex, when first picked up, emit a very distinct, but evanescent, scent. Douglas and Scott (*Brit. Hemipt.*, p. 542) say that:—"The insects, if handled, give out a delicate odour like that of ripe pears." In my experience only about one-half of the individuals handled emit any odour at all and the smell reminded me of a rather coarse and unripe pineapple and in the case of the male found on 2.x I noted the smell as being rather rancid.

Douglas and Scott say that this bug is found "under the shelter of heather, furze and other bushes," but at Rodborough I find it running

about fully exposed on the small bare stony patches between the sparse low-growing hillside plant-carpet—in fact, *Coranus* and *Hallodapus montandoni* occur in precisely the same situations.—T. BAINBRIGGE FLETCHER, Rodborough, Glos., 10.xi.1944.

A LATE GRASSHOPPER.—In his little book Malcolm Burr says (p. 68) that he has “never found Acridinae in this country later than the last week of September.” Here several species occur well into October in most years. This morning, being sunny albeit with a Northerly breeze and a shade temperature of 34° F. after an earlier ground-frost, I went out onto the Common to see if any Grasshoppers were still to be found and soon came across a fairly active female of *Gomphocerus rufus*.—T. BAINBRIGGE FLETCHER, Rodborough, Glos., 15.xi.1944.

A NOMEN NUDUM? (LEP.: GELECHIADAE).—In *Ent. Rec.*, xlviii, 95 (ix.1936), in a paper on Lepidoptera from Skye, the late W. S. Gilles stated that “*Telphusa triparella* r[ace] *myricae* has been bred commonly from bog-myrtle,” but I do not trace any description of the name *myricae*, so presume that it is an undescribed *nomen nudum*. Can any reader refer me to any description? Meyrick's *Revised Handbook* quotes only Oak as the foodplant of this species, but *Myrica gale* is recorded also by Continental authors (e.g., Hering, Benander, Müller-Rutz, and Meess in Spuler) although I do not know that any difference has been noted between forms reared from oak and from *Myrica*, other than Gilles' non-descript “race.” This species has already many names, those known to me being:—*Tinea paripunctella*, Thunberg, *Diss. Ins. Suec.*, vii, p. 96, No. 43 (1794). = *Recurvaria dodecea*, Haworth, *Lep. Brit.*, [iv], pp. 549-550, No. 12 (1828). = *Anacampsis dodecella* [nec Linn.], Steph., *Cat. Brit. Ins.*, ii, p. 196, No. 7191 (1829). = *Gelechia* (*Gelechia*) *triparella*, Zeller, *Isis*, xxxii, p. 200, No. 47 (iii.1839). = *Oecophora tigratella*, Costa, *Fauna Regno Napoli*, *Lepidott.*, *Oecoph.*, p. 2, t. 2, f. 3 [?1836-1840]. *Telphusa triparella* var. *sultanella*, Caradja, *Iris*, xxxii, p. 104 (30.vi.1930). *Teleia triparella* ab. *griseëlla*, Priessecker, *Vêrh. z.-b. Ges. Wien*, lxxxi, p. (18), (1931).

If, therefore, the name “*myricae*” has any validity (as being based on a description), it may fall to one of these previous names.—T. BAINBRIGGE FLETCHER, Rodborough, 24.xii.1944.

CURRENT NOTES.

MICE EATING ELECTROCUTED HORNETS.—A friend of mine living at Rumalihisari, near Istanbul, was annoyed by a hornet's nest under the eave of his loft, so he worked out a very ingenious dodge. He found the entrance was through a horizontal slit between two boards, just above a sheet of lead. He placed a coil alongside this slit, through which he passed a current. Every hornet that came to the slit settled on the gutter which was quickly clogged by the dead insects. It was uncanny to watch them as the death was so silent and so inevitable.

I filled a match-box with dead hornets, which I placed in a drawer in my room.

A few days later my wife called me to the rescue as there was a wild mouse in the room. Moreover, it was behaving in a strange manner. It seemed undecided in its movements, was very tame, and allowed me to pick it up. Then it quietly expired in my hand. Shortly after that, when I had occasion to look at the hornets, I found them in fragments.

The most likely explanation of the incident is that the mouse had eaten their poison bags and died of hornet poison, posthumously.—M. BURR.

Will all those readers who have Lepidoptera from the Shetland Islands look up their species and note the variation. Dr Bryan P. Beirne has written us an article on "The Lepidoptera of Shetland" with a List of Species and wishes to know more about some of them. It will appear in the April number.

OBITUARY.

G. T. BETHUNE-BAKER, F.R.E.S., F.Z.S., F.L.S.

Mr G. T. Bethune-Baker was a native of Birmingham, where his father was in practice as a doctor. He had a knowledge of natural history, and possessed a collection of British Lepidoptera. The son thus started life with an incentive for the same study. This influence was increased by his father's friends, one of whom was Dr Jordan, a doctor in the same city and a well-known entomologist. It was the daughter of this friend of his father's that the young Bethune-Baker subsequently married. Another early influence was that he was brought up as a strict churchman and as he got older he took part in local and diocesan matters. The influence of his father gave him an opportunity for business, and we find, in after life, he was actively connected with several firms in the city of Birmingham. It was with interest in these three directions that his life was spent from his birth in 1856 until his decease in December last (1944) at the ripe old age of 88.

At the earliest he joined the Birmingham Natural History Society and later was one of the strong supporters of the Birmingham Entomological Society, of which he was for several years President and to which he informed me (when I was paying him a visit) that he intended to present the collection of the famous Richard South, acquired when the latter felt he must part with it.

His business training led him to take an interest in local matters and this, with his activity in church matters, led him to accept a seat on the City Education Committee. Here he came in contact with an active member of the City Council, Sir George Kenrick, who also was an entomologist. Later they were associated in various entomological matters. His diocesan connection brought Bethune-Baker to meetings in London, and this gave him opportunities still further to increase his activity in his life's hobby, already shown by his observations in the entomological journals of the day. In London he visited the British

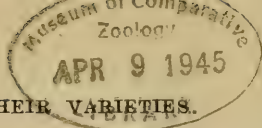
Museum of Nat. History: he saw many whose names he had seen in entomological literature; he went to Tring and to meetings of the learned Societies, as opportunities occurred. Later he joined the three Societies that dealt with his beloved Lepidoptera and contributed to their Publications some of his own work. He was elected on the Council of the Entomological Society of London for some years and became in due course President for two years, 1913-1914. Early in his visits to London he was attracted to the work of the founder of this magazine, the late J. W. Tutt, whose energy seemed unbounded. Influenced by his new acquaintance, he was led to share the visits of other entomologists to the continent of Europe which the pioneer reports in Tutt's writings made so attractive to many of us. His observations are recorded in our magazine on many occasions. He visited the Pyrenees, the Mts. of Central France, the Swiss Alps with his friends or his wife. It was shortly after one of these visits to the Alps that his wife died from cancer.

His early work was observational and descriptive of new material. For Tring he described and illustrated discoveries in the New Guinea area, but he became particularly attracted to the "Blues" of the Indo-Malayan Region. For this work he acquired a knowledge of microscopy to depict the genitalia of each species, of which the value for taxonomic purposes was becoming recognized (at that time) in the Lepidoptera. This principle he employed in his work on the Classification of the Palaearctic Blues. Regretfully to those who knew him, there is no doubt that the long continued intensive work with the microscope was the cause of his total blindness in the last few years of his life.

On the death of Tutt in 1911, Bethune-Baker did all he could to aid the continuation of his (Tutt's) work in entomology, which went on until his end; even when his sight failed he carried on, for his name was still on the panel as "Editor-Emeritus," and all matter published was sent to him in proof for his experienced suggestion.

He gave great attention to Nomenclature in the Lepidoptera and was Chairman of the Entomological Society's Committee on this subject. Unfortunately, the Report of this Committee was ignored.

As soon as it was found that his sight was never likely to recover, he arranged that his Library and Collections should go to Cambridge, where his brother held a post in the University. The essential material in the collection was subsequently passed to the British Museum. He went to live with a friend at Eastbourne, a doctor and his wife. On the death of the latter the arrangement was broken up and he married Miss Bertha Nice, a lady who had nursed him during a severe illness at Eastbourne, and was very happily settled in a small house he had acquired. There he died peacefully of old age in his 88th year.--
Hx. J. T.



equally wherever the species exist. The green ground is usually either of a rather dark green or some shade between this and greenish-white or pale reddish-green; but also more rarely reddish-white, or white clouded with light red or purplish pink; the black marbling also varies greatly in intensity and extent, in some specimens presenting delicate pale markings, grey rather than black; in others close and abundant, yet definite marbling, in some cases with the stigmata and pale spots much obscured, in others with all these very strongly defined; others again have strong and very heavy blotching of the darker surfaces, either dark brown or black, with stigmata and central blotches white or tinged with pink or light red. One specimen before me is greenish-white, with the faintest possible marblings, merely a black loop with some purplish-pink around it in the middle of the wing and some black dots along the costa; another has the dorsal margin, apex, stigmata and usual round blotches white, the rest of the wings marbled with red and deep black; a third even blacker, has all the pale markings light purplish-pink; and a fourth is dark green, with but faint indications of paler spots. Dr Mason has a specimen of a clear pale green, with an irregular light red shade through the middle, and branching to the anal angle, with only a few dark dots and streaks. These are perhaps the more extreme forms, but some of them are not infrequent, and every possible grade and combination of intermediate variation is found. In Scotland there is a tendency to somewhat deeper blackness of colour and marking, some examples being very nearly black."

The Forms and Names to be considered:—

- protea*, Schiff., *Verz.*, 84, p. 7 (1775). Invalid.
- protea*, Esp. (1790+?), *Abbild. Noct.*, IV, 494, plt. 150, 6.
- protea*, Bork. (1792), *Naturg. Noct.*, IV, 386. Syn.
- seladonia*, Haw. (1809), *Lep. Brit.*, II, 199. [Syn. ?]
- ab. *variegata*, Tutt (1892), *Brit. Noct.*, III, 78.
- ab. *suffusa*, Tutt (1892), *l.c.*
- ssp. *corsica*, Splr. (1905), *Schm. Eur.*, I, 206, plt. 39, 3.
- ab. *grisea*, Warr.-Stz. (1910), *Pal. Noct.*, III, 134, plt. 32h, i, 33a.
- ab. *dejecta*, Warr.-Stz. (1910), *l.c.*
- ab. *incolorata*, Warr.-Stz. (1910), *l.c.*

Tutt dealt with (1) *protea*, Bork., pale green, tinted reddish; (2) *seladonia*, Haw., dark green, tinted red; (3) *variegata*, black and reddish, whitish inner margin, stigmata and submarginal areas; (4) *suffusa*, black and reddish, pale inner margin stigmata unicolorous.

f. *corsica*, Splr., *Schm. Eur.*, I, 206 (1905).

ORIG. DESCRIP.—“A very rough olive-brown-green form.”

ab. *grisea*, Warr.-Stz., *Pal. Noct.*, III, 134 (1910).

FIG.—*l.c.*, 32i.

ORIG. DESCRIP.—“In which the tints are dark and light grey, with only the least touch of green or brown; hindwing whitish.” Amasia.

ab. *dejecta*, Warr.-Stz., *Pal. Noct.*, III, 134 (1910).

FIG.—*l.c.*, 33a.

ORIG. DESCRIP.—“Decidedly smaller, and uniformly dark grey, with

the markings all more or less obscured, and the hindwing darker." *Amasia*.

ab. *incolorata*, Warr.-Stz., *Pal. Noct.*, III, 134 (1910).

FIG.—*l.c.*, 32i.

ORIG. DESCRIP.—"Has the ground colour pale or dark grey, without coloured tints, except a faint rufous flush along the two folds and the course of the submarginal line." *Amasia*.

Hadena, Ochs. & Tr. (1816-25), Dup., Frr., Gn., Tutt, Barr. [*Melan-chra*, Hb. (1820), Meyr., Meyr.: *Mamestra*, Hb. (1821), Stdgr., Splr., Sth., Culot: *Polia*, Ochs. & Tr. (1816-25), Hamps., Warr., Drdt.] *glauca*, Hb. (1808-9) [Kleem. 1792?].

Tutt, *Brit. Noct.*, III, 78 (1892): Meyr., *Handb.*, 82 (1895): Barr., *Lep. Br. I.*, IV, 193, plt. 155, 8 (1897): Stdgr., *Cat.*, IIIed., 158 (1901): Hamps., *Lep. Phal.*, V, 140 (1905): Splr., *Schmett. Eur.*, I, 173, plt. 37, 1 (1905): South, *M.B.I.*, 245, plt. 122, 5-6 (1907): Warr.-Stz., *Pal. Noct.*, III, 74, plt. 17d (1909): Culot, *N. et G.*, I (1), 107, plt. 18, 7 (1911): Meyr., *Rev. Handb.*, 153 (1928): Drdt.-Stz., *Pal. Noct. Supp.*, III, 101, plt. 14g (1931).

Hb., *Samml. Noct.*, 410 (1808-9), figured the more bluish-grey form, the type, and Geyer-Hb. figured the darker form 800 (1828-32) *aperta*; both good figures. The type was previously known from the figure in Kleeman, *Beitrag Ins.*, I, plt. 48, f. 7 (1792).

Treit., *Schmett.*, V (1), 322 (1825), suggested that *stichica*, Bork., IV, 415, was probably *glauca*, and described from Fb., *Mant.*, II, 173 ("alis deflexis albo fuscoque variis, apice nigro striatis: stigmatibus subocellatis; posteriori reniformi."). [*veniformi* ?]

Dup., *Hist. Nat.*, VI, 322, plt. 92, f. 7 (1826), gave a poor figure, hard and no softness of texture. In vol. VII, 255, plt. 116, 3 (1827), Dup. gave a good figure of the boreal form, *lappo*, Dalm.

Frr., *Neu. Beitr.*, II, 14, plt. 104, 1 (1836), gave a very good figure of the blue-grey form but still a very dark one. In vol. IV, 133, plt. 364, 2 (1842), Frr. gave another figure of a still darker form bred in Hanover, *glauca* var., in which the stigmata are light grey and similar unconnected patches lie in the submarginal area inside the well-marked marginal line.

Gn., *Hist. Nat.*, VI (2), 94 (1852), gave Kleem., *Beitr. Ins.*, I, plt. 48, 1-7 (1792), as the author, and recognised the *lappo*, Dup.

Gn. in 1852 pointed out that Kleeman in 1792 gave a very good figure of *glauca* in his *Beitr.*; that the f. 410 of Hb. was "too blue," that the figure by Geyer-Hb. 800 *aperta* was "too black;" that subsequent authors gave most unreliable figures often taken for varieties, or even new species; and that *lappo* was nothing more than a dark *glauca-aperta*. There was no description with Kleeman's figure.

Barrett, *l.c.*, plt. 158, gave three figures: 3a, a ♀ has a considerable amount of whitish markings compared with the ♂; 3b, has no whitish markings and is one of the darker forms. All three figures are too dark, with no appearance of the glaucous coloration typical of the species.

Meyr. used the genus *Melanchra*, Hb., in both editions of his *Hand-book*.

Stdgr., *Cat.*, IIIed., 158 (1901), gave *aperta*, *lappo*, *quadriposita*, *taunensis*, and *farkasii* as forms: *aperta*, obscura; *lappo*, obscura; *quadriposita*, magis cinerascens; *taunensis*, al. ant. infuscatis; *farkasii*, diluta? (sp. aberrans sine var. const.).

Hamps., *Lep. Phal.*, V, 141 (1905), gave Kleem., *Beitr. Ins.*, I, plt. 48 (43), 1-7 (1792). He recognised the forms *aperta*, *taunensis* and *quadriposita*.

Splr., *Schmett. Eur.*, I, 173, plt. 37, 1 (1905), gave the forms *lappo*, *aperta*, and *taunensis* the more ashy-grey, the especially dark, and the dark reddish-grey uniform forms respectively. He gave a figure in which the claviform stigma was far from being a prominent feature as Culot said.

South, *M.B.I.*, I, 245, plt. 122, 5-6 (1907), gave two very good figures: 5, with lighter markings, more glaucous; 6, a generally darker blackish form.

Warr.-Stz., *Pal. Noct.*, III, 74, plt. 17d (1909), gave three good figures, typical ♂ and ♀ and f. *aperta*; the claviform quite strong in the former but obscured in *aperta*. The bluish grey is mostly wanting. *Ab. polio stigma*, Hamps., is treated as a synonym of the typical form; *ab. quadriposita* is treated as a syn. of *lappo*. Thus *lappo*, *aperta* and *taunensis* are the only forms given.

Culot, *N. et G.*, I (1), 107, plt. 18, f. 7 (1911), gave a good figure and called attention to the special character, a white claviform, and refused to work out the synonymy of any named forms.

Draudt-Stz., *Pal. Noct. Supp.*, III, 101, plt. 14g (1931), added the ssp. *frigida*, Zett.; with the ssp. *paupercula*, Pnglr., from Aksu, Mongolia, and the ssp. *Püngeleri*, Drdt., from Issyk-kul, both of which are figured. They pointed out that *lappo* is very small.

Of the Variation Barrett said:—

“Variable in the ground colour from pale silvery-grey or dusky-white, to purple-grey or slate-grey; still more variable in the intensity and distinctness of the dark markings and cloudings, which frequently extend themselves over almost the whole forewings; all three stigmata usually conspicuous, but the claviform is sometimes reduced to a mere white dot, and more rarely the orbicular is obscured by dark clouding; sometimes the yellow subterminal line becomes distinct and continuous throughout, in others reduced to three or four dots, and in some cases it is white; while in some individuals the nervures are dotted and streaked with white, and more rarely the dark markings are tinged with purple. Very dark forms are obtained from the North of Ireland and the West of Scotland, those from Arran being curiously dark with the stigmata also suffused and indistinct, but the transverse lines conspicuously black.”

The Names and Forms to be considered:—

glauca, Hb. (1808-9), *Samml. Noct.*, 410.

ab. *lappo*, Dup. (Dalm.) (1827), *Hist. Nat.*, VII (1), 255, plt. cxvi, 3.

f. *aperta*, Hb.-Gey. (1828-32), *Samml. Noct.*, 800.

r. *quadriposita*, Zett. (1840), *Ins. Lappon.*, 939.

ab. *farkasii*, H.-S. (1850), *Sys. Bearb.*, II, 254, f. 390.

- r. *poliostigma*, Hamps. (1894), *Moths of India*, II, 201, f.
 r. *taunensis*, Fuchs. (1899), *Jahrb. Nass.*, LVII, 133.
 r. *paupercula*, Pnglr. (1902) (1934), *Iris*, XV, 148 [Drdt.-Stz., *Pal. Noct. Supp.*, III, 101, plt. 14g].
 r. *püngeleri*, Drdt. (1934), *Pal. Noct. Supp.*, III, 101, plt. 14g.

Tutt dealt with: (1) the typical form *glauca*, Hb. 410, the more bluish form and not so uniform as the blacker form (subsequently named *aperta*, Hb.-G. 800); (2) f. *lappo*, Dup., smaller, more ashy, edging pale; (3) ab. *quadriposita*, Zett., "the glaucous tint reduced to a minimum and replaced by fuscous."

f. *aperta*, Hb.-Gey., *Samml. Noct.*, 800 (1828-32).

FIG.—*l.c.*, 800. A very good figure of the darker form, with the blue and grey suppressed in the general blackish ground.

DESCRIP.—"Much less slaty-grey on forewings, a very slight bluish-tinge, the stigmata the lightest features even with small traces of pure white. Transverse lines black. Traces of cuneiform markings, very inconspicuous. Generally characters obscure."

f., ab. *farkasii*, H.-S. (nec Tr.), *Sys. Bearb.*, II, p. 254 (1850).

FIG.—*l.c.*, 390. The figure is certainly not a *chenopodii* var. Under this name Frivaldsky had sent H.-S. a Noctuid, which he considered was a form of *chenopodii*, Fb., but undoubtedly a form of *glauca* and the reference to that species (*chenopodii*) is in error. Hamp., *Lep. Phal.*, IV, placed it among his references to *glauca*. The figure in H.-S. 390 is a very pretty banded form. The band is very distinctive. Its confining lines are deep black emphasized by light grey margins outside; the black of these lines extending considerably along each of the veins. The band filling is only slightly darker than the general grey of the ground.

race *poliostigma*, Hamp., *Moths of Ind.*, II, 201 (1894).

ORIG. DESCRIP.—"♀ fuscous, suffused with grey. Forewing with traces of subbasal and antemedial lines; the orbicular and reniform large and whitish; a black streak below the cell; indistinct postmedial and submarginal lines, the former excurved around the reniform, the latter with a series of dentate marks on it. Hindwing brownish fuscous; the cilia white."

"Sind Valley, Kashmir."

race *taunensis*, Fuchs., *Jhrb. Nass.*, LVII, 133 (1899).

ORIG. DESCRIP.—"The darkest of all *glauca* forms, a transitional form to var. *lappo* and probably a product of the rough mountain climate."

It differs from all *glauca* specimens by the uniform sooty-grey colour of its forewings. The bluish-white emphasis of the three stigmata and the border areas on both sides of the waved line (by which *glauca* appears variegated) so characteristic and bright in *glauca* are wholly wanting in our Taunus form; these wing-markings are also covered by the above-mentioned sooty-grey, so that the species presents a quite unicolorous appearance to the variegated *glauca*. My female comes next to *lappo*, Stdgr., whose border area is dark suffused but that has light stigmata and its fore-wings are less marbled." Taunus.

ab. *paupercula*, Pnglr., *Iris*, XV, 148 (1902) [Drdt.-Stz., *Pal. Noct. Supp.*, III, 101 (1934)].

FIG.—Stz., *Supp.*, l.c., 149.

DESCRIP.—“A large sleek, very pale olive-brownish form.” Mongolia, Aksu.

f. *püngeleri*, Drdt.-Seitz, *Pal. Noct. Supp.*, III, 101 (1934).

FIG.—l.c., plt. 14g.

ORIG. DESCRIP.—“Larger but with remarkably wide wings, paler and duller grey, in consequence of which the subterminal area and two stigmata appear more unicolorous.” Issyk-kul.

Hadena, Ochs. & Tr. (1816-25), Dup., Gn., Barr. [*Polia*, Ochs. & Tr. (1816-25), Hamps., Warr.-Stz., Drdt.-Stz.: *Melanchra*, Hb. (1820), Meyr. (2): *Mamestra*, Hb. (1822), Meyr., Stdgr., Splr., South, Culot] *nana*, Hufn. (1766) = *dentina*, Schiff. (1775) [Fab. (1787)].

Tutt, *Brit. Noct.*, III, 80 (1892): Meyr., *Handb.*, 82 (1895): Barr., *Lep. Br. I.*, IV, 197, plt. 159, 1 (1897): Stdgr., *Cat.*, IIIed., 159 (1901): Splr., *Schm. Eur.*, I, 174, plt. 37, 2 (1905): Hamps., *Lep. Phal.*, V, 140 (1905): South, *M.B.I.*, I, 246, plt. 122, 7-9 (1907): Warr.-Stz., *Pal. Noct.*, III, 73, plt. 17c, d (1909): Culot, *N. et G.*, I (1), 108, plt. 18, 8-9 (1911): Meyr., *Rev. Handb.*, 153 (1928): Draudt-Stz., *Pal. Noct. Supp.*, III, 101, plt. 14g (1931).

Ernst & Engram., *Pap. d'Eur.*, VI, p. 121, fig. 356 (1789), gave a fine series of forms a, b, c, d, e, f, g, well exhibiting among other points of variation the variable dentate central marking.

Hufn., *Berlin Mag.*, III, 398, No. 71 (1766).

ORIG. DESCRIP.—“Anterior wings whitish-grey shading into dark grey, with a whitish-grey dentate spot in the middle of the forewings. On tree trunks: common.”

Hufn., *Berlin Mag.*, III, No. 74 (1766), described a species of Noctuae under the name *nana*, which description in 1776 was amplified and re-described by Rottemberg. This latter description is that of *conspersa* with many white features, while Hufn.'s description is definitely grey, whitish-grey and dark grey. But Rott. took the name *nana* for his species hence the next available name must be used, viz., *dentina*, Esp., a very suitable one because of the whitish-grey dentate blotch below the orbicular stigma; and the name *nana* becomes a Syn.

Schiff., *Verz.*, P. O. 82. “The brownish-grey tooth-spotted Noctua,” 1775. Illiger, *Neu Ausg. Verz.*, I, 272, gave Fabricius, Bork. and Esper as references, the last, IV, plt. 149, f. 4, *nana*, as a variety.

Esp., *Abbild.*, IV, p. 380, plt. 127 (48), 2-3, gave two quite recognizable figures, which he named *dentina*, and p. 486, plt. 149 (70), 4-5, which he named *nana*. All four are certainly the same species. The latter are apparently aberrational forms. Werneb., *Beitr.*, II, 42, said the former were *nana*, Hufn. (*dentina*, Tr.), and the latter (p. 46) were the species *marmorosa*, Bork. But Borkhausen's description does not agree with the figures of Esper. The “tooth” spot is the transformed claviform, and in the second pair of Esper's figures is extended, not to join the orbicular, but lengthwise below towards the base of the wing.

Marmorosa, Bork., is treated by Seitz in the genus *Scotogramma* close to *chenopodii* (*trifolii*), IV, 83.

Bork., *Naturg.*, IV, 415 (1792), gave as synonyms Schiff., *Verz.*, p. 82, *dentina*; Esper, *Abbild. Noct.*, IV, plt. 48, 2-3, *dentina*, plt. 70, 4-5, *nana*?; Fab., *Mant.*, II, 156, *dentina*; and de Vill., *Linn. Ent.*, II, p. 279 (1789), *triquetra*, corrected in IV, p. 468, to *dentina*. He stated that *nana*, Hufn., is none other than *conspersa*, Schiff.

Hb., *Samml. Noct.*, 408 (1808-9), gave an excellent figure of *dentina*, and Geyer 874 in 1838 as *latenai*, a beautiful figure with an almost pure white tooth-mark.

Hb., *Text*, p. 192, No. 56, gave *nana*, Schiff., as a synonym.

Duponchel, *Hist. Nat.*, VI, 266, plt. 89, 6 (1826), gave an excellent figure of the usually occurring form. He placed it in the genus *Hadena*.

Gn., *Hist. Nat.*, VI (2), 95 (1852), gave *plebeja*, Haw., and *leucostigma*, Haw., as synonyms. He gave the *nana*, Esp., as a separate species with the synonyms *marmorosa*, Bork., and *odontites*, Bdv. He gave no reference to Hufn.

Barrett, *l.c.*, plt. 159, has five figures all too dark generally and not giving the impression of the species intended. The "pale grey or pale brownish-grey" of the text is absent. 1d, is a curious yellow suffused specimen.

Stdgr., *Cat.*, IIIed., 159 (1901), gave *hilaris*, Zett., as a Syn. (ab. dilutior), and *nana*, Hufn.? a Syn.; he recognized ab. *latenai*, Pier. (and gave ? *proxima*, Frr. "multo obscurior") as a Syn. of *latenai*.

Hamp., *Lep. Phal.*, V, 140 (1905), gave ab. *latenai*, Pierret, and as synonyms *plebeia*, Haw., *leucostigma*, Haw., *proxima*, Frr., and *hilaris*, Zett.

Splr., *Schm. Eur.*, I, 174, plt. 37, 2 (1905), gave a good figure under the name *nana* and recognized the forms *ochrea*, Tutt, *hilaris*, Zett., and *latenai*, Pierr.

South, *M.B.I.*, I, 246, plt. 122, f. 7-9 (1907), gave three useful figures under the name *dentina*. The Siberian form is *latenai*, Pierret.

Warr.-Stz., *Pal. Noct.*, III, 73, plt. 17c, d (1909), gave five figures too much alike in distinctive shades, 17c *nana* typical and a quite distinctive *leucostigma* whiter or fulvous; 17d *ochrea*, ♂ and ♀ *latenai*. He said it was the *dentina*, Schiff., and the *plebeia* of Haw. synonyms. He put *proxima*, Frr., as a syn. of *latenai*.

Culot, *N. et G.*, I (1), 108, plt. 18, 8-9 (1911), gave two very good figures under the names *dentina* and *latenai* (this appears to be the form called *proxima* by Frr.).

Drdt., *Pal. Noct. Supp.*, III, 101, 14g (1931), gave a new and better figure of form *leucostigma*, Haw., too reddish-yellow in the former illustration. They gave two new forms, the *variegata*, Vorbr., and *schultzi*, Rebel., a red-brown form and a dark form with grey-white outer band.

Barrett's comment on the Variation was:—

"Variable in the general colour through almost all shades of grey, greyish-white, grey-brown, and bluish-grey; and in the distinctness of the dark markings from black to brown of all shades of umbreous. The pale markings also are often clouded and sometimes almost completely obscured. In the collection of Mr S. J. Capper are forms ranging from the palest grey-brown, almost devoid of markings, to the darkest smoky-grey, or to those which have all the darker markings black; and

one specimen of a pale grey has a broad dirty-white blotch where the dark markings are usually situated. Dr Mason has one in which the reniform stigma and a large portion of the adjoining usually dark area are occupied by a large white blotch extending to the costa. Another form has a large ovate white blotch near the anal angle. One obtained at Ipswich, by the Rev. E. N. Bloomfield is so filled up with black that the usually distinct central bar is obscured. Another taken at Armagh by the Rev. W. F. Johnson is so curiously mottled with grey as to bear a considerable resemblance to *H. glauca*."

This species must be considered in conjunction with Tutt, *Brit. Noct.*, III, 34 (*conspersa* = *nana* and Turner, *l.c. Supp.*, p. 93, bearing in mind that Hufnagel's original description fitted two species.

The Names and Forms to be considered are:—

- nana*, Hufn., *Berl. Mag.* (1766), 3, No. 71.
- dentina*, Schiff. (1775), *Verz.*, 82, Syn.
- dentina*, Fab. (1787), *Mant.*, II, 157.
- dentina*, Esp. (1789+?), *Schm. Abbild.*, IV, 380, plt. 127, 3, Syn.
- ab. *leucostigma*, Haw. (1809), *Lep. Brit.*, 198.
- ab. *plebeia*, Haw. (1809), *l.c.* (Syn. ?).
- ab. *proxima*, Frr. (1831), *Neu. Beitr.*, II, 15, plt. 104, 2.
- f. *latenai*, Pierr. (1837), *Ann. Soc. e. Fr.*, 177, plt. 8, 3.
- ssp. *hilaris*, Zett.? (1840), *Ins. Lapp.*, 938.
- ab. *obsoleta*, Tutt. (1892), *Brit. Noct.*, III, 81.
- ab. *ochrea*, Tutt (1892), *l.c.*
- ab. *ochrea-obsoleta*, Tutt (1892), *l.c.*
- ab. *schultzi*, Rbl. (1899), *Berl. e. Zt.*, XLIV, 159, fig.
- ab. *variegata*, Vorbrodt (1917), *Mitt. Schw. Ges.*, XII, 457.
- ssp. *reducta*, Rbl. & Zrny. (1931-2), *Lep. Fn. Albaniens*, p. 92, fig. 18.
- ab. *brunnescens*, Schwd. (1938), *Zts. Oest. Ent. Ver.*, XXIII, 26 (1938).
- ab. *canescens*, Schwd. (1938), *l.c.*
- race *hawelkae*, Schwd. (1938), *l.c.*, p. 41.
- ab. *littoralis*, Schwd. (1938), *l.c.*
- race *gredensis*, Schwd. (1938), *l.c.*, 42.
- race *nevadensis*, Schwd. (1938), *l.c.*
- ssp. *sultania*, Swing. (1938), *Ent. Rund.*, LV, 224.

Tutt dealt with: 1, *nana*, whitish-grey shading to dark grey; 2, *leucostigma*, whitish-grey; 3, ashy-grey *dentina*; 4, *ochrea*, ochreous-grey; 5, *latenai*, brownish-black; 6, *obsoleta*, darker markings obsolescent, almost unicolorous; 7, *ochrea-obsoleta*.

plebeia, Haw., *Lep. Brit.*, 198 (1809).

ORIG. DESCRIP.—Haw. gave this as the *dentina*, Hb., 87, 408, and his own *dentina* as of Fab. and expressed the opinion of their close similarity. In this he gave the "stigmatibus tribus cinereis," while in his *dentina* he gave "macula basi, strigaeque dentata flavis."

proxima, Frr., *Neu. Beitr.*, II, 15, plt. 104, 2 (1831), gave a very good figure of this form, which had been in his collection for a long time as an aberration of *dentina*.

ab. *proxima*, Frr., *Neu. Beitr.*, II, 15, plt. 104, 2 (1831).

ORIG. DESCRIP.—"I attribute the male of this species to Hb.; according to the description of Treit. a very exact figure of the female.

It comes nearest to *dentina*. This example has stood a long time in my collection as an ab. of *dentina*, for I trusted in Herr Treit. description, according to which *N. proxima* had the tooth-like marking under the orbicular and close to the claviform, which should be wanting, while in my example this marking is very distinct. Closer examination and the opinion of many of my friends determines that this example is actually *proxima*. The probability is, that the whitish examples in nature are unknown to me, but this *dentata*-marking is more dusky, or probably mixed, as Herr Treit. noted.

ssp. *hilaris*, Zett., *Ins. Lapp.*, 938 (1840).

ORIG. DESCRIP.—“*Alis anticis cano fuscoque variis, macula bifida cum macula ordinaria interiori subtus confluenta strigaeque postica dentata albis.*”

Similar to *dentina*, but a little smaller and more whitish. Markings pale in the forewings as in *dentina*, but the bifid spot wholly confluent with the anterior stigma, both forming one larger angulated spot with a bifid extension.

ab. *schultzi*, Rbl., *Berge*, 9ed, 183 (1909).

FIG.—*Berl. ent. Zeit.*, XLIV, 159 (1899), Schultz.

ORIG. DESCRIP.—“Darkened as in *latenai*, but with more indistinct stigmata, a prominent whitish-grey outer band and blackish darkened marginal area beyond the waved line.” (*Berge.*)

“Between the margin of the forewing and the distinctly prominent yellowish powdered waved line the marginal area is filled in with deep black, but the wing veins crossing it are powdered whitish-yellow and show sharp on the dark ground. Before the waved line on the basal side there lies a wide area which stands out strongly from the rest of colour of the forewings by its grey-white suffusion. In its lower part this pale area near the inner margin is bordered by a deep black dark streak which reaches almost up to the only very indistinctly developed stigmata. Two parallel lines, of which that lying nearest to the discal area is strongly emphasized, separate the basal area of the wing. The whole wing from the base to the pale band is of a grey-brown colour, here and there, particularly in the basal area along the inner margin, suffused with a yellowish tinge. The costa of the forewing has a number of darker dots on the grey-brown ground.” Near Berlin (*Berl. e. Zt.*).

ab. *variegata*, Vorb., *Mitt. Schw. Gess.*, XII, 457 (1917) [*Zts. Oest. Ent. Ver.*, XXIII, 27 (1915)].

DESCRIP.—Schawerda: “Is a striking individual form from Büren, in which the discal area (with the exception of the orbicular) and the outer area are suffused red-brown. The yellow basal spot is coloured deep orange.” Switzerland.

ssp. *reducta*, Reb. & Zerny., *Lep. Fn. Albaniens*, p. 92, fig. 18 (1931).

ORIG. DESCRIP.—“Obviously definitely smaller than the specimens from central Europe. (Wing expanse 14-16 mm.) Forewings much less clearly marked, often strongly blue-grey in tone; above all the orbicular and the spot which is attached to the end of it below the cell is not so light whitish-grey as in typical examples, and is thus very little different from the rest of the wing surface. The ♀♀ are mostly darker than

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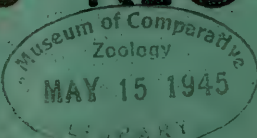
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F.R.C.P.

J. E. COLLIN, J.P., F.R.E.S.

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IS *LABIA MINOR* DOUBLE-BROODED?

By MALCOLM BURR, D.Sc., F.R.E.S.

It is always stated in the books that the Lesser Earwig is most frequently observed flying on hot June days in the neighbourhood of manure heaps. I remember how in my cricketing days I often used to catch *Labia minor* flying past me when out in the deep field.

The fact that it flies so freely in the sunshine and that it is mature in June distinguish it sharply from the Common Earwig. Also, while the genus *Forficula* is dominantly Palaearctic, the genus *Labia* is tropical in distribution. *L. minor* ranges right through Africa, and across from England to Vladivostok. It is the only species of the family *Labiidae*, of which there are several dozen species, that occurs in Europe.

Yet, with all these distinctions, it is a neglected insect, and, so far as I am aware, practically nothing is really known of its life history.

Professor Kosswig has brought me a tube containing three males, three females and three larvae, which he found in a rotten palm trunk in the garden at Balta Liman, on the shore of the Bosphorus, in November.

Now the larvae of the Common Earwig become mature in August, after which date larvae are not to be found.

Although the early summer has been so far regarded as the normal season for the adult *L. minor*, their occurrence in the late autumn is not unknown. I remember one October about thirty years ago, when there was a spell of very warm, muggy weather, *L. minor* turned up in conspicuous numbers. I cannot now recall the year, but Mr Donisthorpe may remember. He noticed the occurrence, and found them flying to street lamposts.

It seems to me that the explanation may be that the Lesser Earwig is double-brooded.

There is scope here for some interesting observation. If any reader comes across a colony of *Labia minor*, will he please start some breeding experiments?

[My only Glos. record of *L. minor* is one at Darlingworth, 3.iv.43 (Shaw): this may indicate a hibernated adult.—T. B. F.]

THE LEPIDOPTERA OF SHETLAND.

By BRYAN P. BEIRNE, Ph.D., M.R.I.A., F.R.E.S.

The following list of the species of Lepidoptera occurring in Shetland was compiled when studying the distribution of the British Lepidoptera recently (see *Proc. R. Irish Acad.*, 47B: 91-101). It is probably not complete but includes all the species recorded in the British entomological periodicals I had available, and, as no reasonably complete list of the Shetlandic Lepidoptera has been published previously, it may be of some use to future collectors in those islands, particularly in drawing attention to the many species requiring confirmation, until such time as a full list is published by someone with personal experience of collecting in Shet-

land. It is hoped that some readers of the *Entomologist's Record* will be able to publish additional information concerning some of these doubtful species, while confirmation of many of the reliably-recorded species is also desirable, as in a relatively large proportion of cases only single records exist; this applies particularly to the Microlepidoptera. The Shetlandic Lepidoptera will repay further study, as a greater proportion of the species exhibit local variation than do the species in any other area of the British Isles.

I have been unable to find the original records, if any, for the following species, stated to occur in Shetland by South (*Moths Brit. Is.*): *Tethea* or, *T. duplaris*, *Euxoa tritici*, *Apamea oblonga* (*abjecta*), *A. anceps* (*sordida*), *Rhizedra lutosa*, *Xylina vetusta*, *Scoliopteryx libatrix*, *Thera juniperata* and *Epirrhoë tristata*. Meyrick (*Rev. Handb. Brit. Lep.*) includes in addition: *Pieris brassicae*, *P. rapae*, *Coenonympha pamphilus*, *Agrochola circellaris*, *Colostygia salicata*, *Operophtera brumata*, *Philedone prodromana*, *Epiblema semifuscana*, *Hemimene acuminatana*, *Eupista crocogramma* and *Eriocrania semipurpurella*. Most of the above species are also included by Barrett (*Lep. Brit. Is.*), who also gives *Bombicia viminalis* and *Eupithecia pulchellata*. The records for *B. viminalis*, *T. juniperata* and *E. tristata* are almost certainly correct, as Barrett mentions that these species are represented by local forms in Shetland, but confirmation of the remaining species is desirable. Wolff (*Zoology of the Faroes*, II) gives a list of the Shetlandic species and includes the following for which I can find no other records: *Diarsia brunnea*, *Meristis trigrammica*, *Poecilopsis lapponaria*, *Hydriomena furcata* (*sordidata*), *Crambus furcatellus*, *Cnephasia bellana* (*penziana*) and *Agonopteryx* (*Depressaria*) *applana*. Confirmation of *P. lapponaria* is particularly desirable.

The following are some other species requiring confirmation:—

Polyommatus agestis race *artaxerxes*: According to Walker (*Ent. Mo. Mag.*, LVIII: I) this was taken on Unst by W. Claridge Druce, a botanist.

Lasiocampa quercus: Not previously recorded from Shetland. There is a male labelled "Unst, 14.viii.89" in the collection of Mr M. S. D. Westropp, of Dublin, but with no indication of the captor's name. The specimen is a variety in which the yellow of the hindwings does not form a narrow band but extends to the edge of the wing; the forewings are similar but somewhat darkened towards the edge and tip. Is the specimen a representative of a Shetlandic local race?

Parasemia plantaginis: According to Newman (*Proc. S. Lond. N.H. Soc.*, 1912: 100) this species died out in Shetland some time prior to 1912 owing to attacks by ichneumons. Has it been seen since?

Eulype hastata: Recorded by Tugwell (*Ent. Mo. Mag.*, XXVII: 83), and probably correct, but is it *hastata* or *subhastata*?

Agonopteryx (*Depressaria*) *badiella*: recorded by King, Bright and Reid (*Ent. Mo. Mag.*, XXXII: 5), but the record is queried by Meyrick. Is this the species Wolff records as *applana*?

Aegeria muscaeformis: Briggs (*Entom.*, XVII: 200) records finding a large mine in the roots of Thrift such as is made by the larva of this species. Has the adult ever been taken?

Records almost certainly incorrect are: *Eupithecia nanata*, which has been recorded by several of the older collectors, but there seems to be

little doubt that the specimens were the local forms of *E. venosata* or of *E. satyrata*, and *Zygaena exulans*, stated to occur in Shetland by Rowland-Brown (*Entom.*, LII: 217), but Curwen (*ibid.*, LIII: 17) is of the opinion that the specimens were incorrectly labelled.

All the following species are apparently reliably recorded from Shetland, but it is possible, however, that there has been some confusion between the species of *Scoparia*, *Cnephasia* and *Hemimene*. Only single records exist for many of the species, and in all cases confirmation would be useful. Thus, Shetland is apparently the only known British locality for *Cataplectica auromaculata*, but I can find no records for this species during the past sixty years. In all cases further information on the variation exhibited by Shetlandic specimens is desirable. Species known to exhibit local variation in Shetland are marked with an asterisk.

- Aglais urticae*.
Nymphalis antiopa.
Vanessa cardui.
V. atlanta.
Coenonympha tullia.
Acherontia atropos.
Herse convolvuli.
Celerio galii.
Macroglossum stellatarum.
Leucoma salicis.
Parasemia plantaginis.*
Apatele euphorbiae.*
Agrotis ipsilon (suffusa).
Euxoa cursoria.*
E. nigricans.*
Lycophotia varia (strigula).*
Peridroma porphyrea.
Ammogrotis lucerneae.*
Rhyacia simulans.*
Amathes alpicola (alpina).*
A. glareosa.*
A. c-nigrum.
A. xanthographa.*
Diarsia festiva.*
Triphaena orbona.
T. pronuba.
Eurois occulta.*
Polia tincta.*
Mamestra brassicae.
Diataraxia oleracea.
Hadena nana (dentina).*
H. conspersa.*
Cerapteryx graminis.*
Dasypolia templi.*
Eumichtis adusta.*
Phlogophora meticulosa.
Apamea exulis.*
A. furva.
A. obscura (gemina).
A. sordens (basilinea).
A. monoglypha.
A. secalis (didyma).
Procus fasciuncula.
Celaena haworthii.*
C. leucostigma.
Hydraecia micacea.
Leucania pallens.
Caradrina clavipalpis (quadripunctata).
Orthosia gothica.
- Anarta melanopa*.*
Plusia gamma.
Carsia paludata.
Eulypé hastata (see above).
Lygris testata.*
Dysstroma citrata (immanata).*
Chloroclysta miala.
Xanthorhoë munitata.*
X. montanata.*
X. fluctuata.*
Colostygia didymata.*
Entephria caesiata.*
Euphyia bilineata.*
Perizoma albulata.*
P. blandiata.*
Eupithecia venosata.*
E. satyrata.*
Hepialus humuli.*
H. fusconebulosa (velleda).*
H. lupulina.
Crambus pascuellus.
C. pratellus.
C. culmellus.
C. hortuellus.
C. perlellus.
Nomophila noctuella.
Pyrausta cespitalis.*
Scoparia alpina.*
S. angustea.
S. mercurea (frequentella).
S. ambigualis (atomalis).
Phalonia cnicana.
P. ciliella.
Philedone gerningana.
Euxanthis angustana.*
Tortrix rusticana.
T. musculana.*
Cnephasia osseana.*
C. colquhounana.*
C. octomaculana.*
Peronea aspersana.
Ancylis unguicella.
Eucosma murcuriana (mercurinana).
Bactra lanceolana.
Endothenia antiquana.
Polychrosis dubitana (littoralis).*
Argyroploce schulziana.*
A. lacunana.
Hemimene plumbagana.

<i>H. tanacetii</i> .*	<i>A. fabriciana</i> .*
<i>H. consortana</i> .	<i>Glyphipterix thrasonella</i> .
<i>Laspeyresia succedana</i> (ulicetana).*	<i>Elachista eleochariella</i> .
<i>Aristotelia tenebrella</i> .	<i>E. rhynchospora</i> .
<i>Bryotropha terrella</i> .*	<i>Caloptilia</i> (<i>Gracilaria</i>) <i>syringella</i> .
<i>Gelechia betulea</i> (<i>ericetella</i>).	<i>C. tringipennella</i> .
<i>Phthorimaea plantaginella</i> .*	<i>Cataplectica auromaculata</i> .
<i>Mompha locupletella</i> .	<i>Plutella maculipennis</i> .
<i>Endrosis lactella</i> .	<i>P. annulatella</i> .
<i>Borkhausenia pseudospretella</i> .	<i>P. senilella</i> (<i>dalella</i>).
<i>Agonopteryx</i> (<i>Depressaria</i>) <i>badiella</i> (see above).	<i>Monopis rusticella</i> .
<i>Anthophila pariana</i> .	<i>Tinea ganomella</i> (<i>lapella</i>).
	<i>Ochsenheimeria bisontella</i> .

COLEOPTERA AT LAMPTON, MIDDLESEX.

By HORACE DONISTHORPE, F.Z.S., F.R.E.S., etc.

(Continued from page 29.)

HYDROPHILIDAE—*Helophorus rugosus*, Ol., *Sphaeridium bipustulatum*, F., *Cercyon lateralis*, Marsh., *C. terminatus*, Marsh., *Megasternum boletophagum*, Marsh., *Cryptopleurum atomarium*, Ol., all in vegetable refuse.

STAPHYLINIDAE—*Aleochara fuscipes*, F., under dead rat; *A. bipunctata*, Ol., *A. crasicornis*, Bois., in vegetable refuse & (Carrion), *A. crassiuscula*, Sahlb., *A. nitida*, Gr., *Oxytropa haemorrhoea*, Staph., *Atheta analis*, Gr., *A. indubia*, Shp., *A. longicornis*, Gr., all in vegetable refuse; *Atheta sordida*, Marsh., *A. nigra*, Shr., *A. laticollis*, Steph., *A. fungi*, Gr., *A. sericea*, Muls., *A. aterrima*, Gr., *A. palustris*, Kies., *A. orbata*, Er., all in vegetable refuse; *Falagria concinna*, Er., evening sweeping; *F. sulcata*, Pk. (all black specimens), both in vegetable refuse; *F. obscura*, Gr., *Oligota parva*, Kr. (abundant), *O. pusillima*, Gr., all in vegetable refuse; *Hypocyrtus longicornis*, Pk., sweeping; *Conosoma immaculatum*, Steph., *Tachyporus chrysomelinus*, L., *T. hypnorum*, F., *T. pusillus*, Gr., *T. brunneus*, F., all in vegetable refuse; *Cilea silphoides*, L., *Quedius mesomelinus*, Marsh., *Q. cruentus*, Ol., beating hawthorn blossoms, and in vegetable refuse; *Q. cinctus*, Pk., *Q. tristis*, Gr., *V. oblitteratus*, Er., *Q. rufipes*, Gr., all in vegetable refuse; *Ocytus olens*, Müll., under stones; *O. ater*, Gr., *O. compressus*, Marsh., *Philonthus aeneus*, Ross., *P. politus*, F., *P. varius*, Gyll., *P. fimetarius*, Gr., *P. cephalotes*, Gr., *P. sordidus*, Gr., *P. concinnus*, Gr., all in vegetable refuse; *Philonthus longicornis*, Steph., *P. jurgans*, Tott., *P. debilis*, Gr., *P. discoideus*, Gr., *Gabrieus nigritulus*, Gr., *G. stipes*, Sharp, *G. bishöpi*, Sharp, *Xantholinus glabratus*, Gr., *X. punctulatus*, Pk., *X. longiventris*, Heer, *Leptacinus parumpunctatus*, Gyll., *L. batychrus*, Gyll., *L. linearis*, Gr., *Stilicus affinis*, Er., *Scopaeus abbreviatus*, Dej. & Muls., *Sunius diversus*, Aub., *Stenus rogeri*, Kr., all in vegetable refuse; *S. similis*, Hbst., *S. paganus*, Er., both sweeping; *Platystethus arenarius*, Fourc., *Oxytelus rugosus*, F., *O. inustus*, Gr., *O. nitidulus*, Gr., *O. complanatus*, Er., *Homalium excavatum*, Steph., *H. caesum*, Gr., all in vegetable refuse; *H. rufipes*, Fourc., beating blossoms; *Megarthus denticollis*, Beck, in vegetable refuse.

SILPHIDAE—*Silpha sinuata*, F., under dead rat.

SCYDMAENIDAE—*Eumicrus tarsatus*, Müll., in vegetable refuse.

TRICHOPTERYGIDAE—*Trichopteryx brevipennis*, Er., in vegetable refuse.

CORYLOPHIDAE—*Sericoderus lateralis*, Gyll., in vegetable refuse.

PHALACRIDAE—*Phalacrus corruscus*, Pk., *P. hybridus*, Flack., both sweeping grass; *Olibrus aeneus*, F., *O. liquidus*, Er., *O. corticalis*, Pz., *Stilbus testaceus*, Pz., all sweeping.

COCCINELLIDAE—*Hippodamia variegata*, Goey., sweeping; *Adalia bipunctata*, L., *Coccinella 10-punctata*, L., *C. 11-punctata*, L., all three sweeping and beating; and ab. *confluens*, Haw., sweeping; *C. 7-punctata*, L., *Halysia conglobata*, L., *H. 22-punctata*, L., *Micraspis 16-punctata*, L., *Scymnus minimus*, Rott., *Rhizobius litura*, F., *Coccidula rufa*, Hbst., all sweeping.

HISTERIDAE—*Hister unicolor*, L., *H. 14-striatus*, Gyll., *H. bimaculatus*, L., *Carcinops 14-striatus*, Steph., all in vegetable refuse; *Saprinus nitidulus*, Pk., under dead rat.

(To be continued.)

THE GENETICS OF STERRHA AVERSATA, L., AB. AMOENATA, FUCHS.

By E. A. COCKAYNE, D.M., F.R.C.P.

Early in July 1942 Mr J. C. L. Phillips caught a rather worn female of *Sterrha aversata* in the garden of Merstone, Tring. Thinking it was an unusual example of ab. *aurata*, Fuchs, I decided to breed from it. It laid only 40 eggs, from which 16 imagines were bred between 15th December 1942 and 29th April 1943. Six were of a salmon hue like the female parent, 3 ♂ and 3 ♀, and 10 were grey, ab. *remutata*, L. (*spoliata*, Stdgr.), 3 ♂ and 7 ♀. Only two opportunities of obtaining pairings occurred, the first between a grey male, which emerged on 6th January and a grey female, which emerged on 7th January, the second between a salmon male, which emerged on 15th January and a salmon female, which emerged on 14th January. No eggs were obtained from the grey moths; the salmon female laid eggs on 16th January, but the number was small. Some were infertile, others failed to hatch, and of the larvae, which did hatch, only a dozen took to their food. These all survived until April, but after that some of the smaller ones died and three large ones died pupating. Ultimately only three moths emerged, a male on 14th June, and two females on 16th and 19th June, but they were all grey.

A. Bergmann (*Ent. Z.*, 1938, 52, 245) has done some work on the genetics of *S. aversata*. From a wild grey female he bred 40 imagines, 10 ab. *aurata*, 30 grey, and from a wild female ab. *aurata* he got 21 *aurata* and 19 grey. From F_2 parents, both grey, he obtained a few *aurata*, but failed to get a pairing between two *aurata*. His F_2 brood proves that ab. *aurata* is recessive, and this is confirmed by the broods obtained from wild females.

Remembering his results I expected that all the moths from my wild female would be grey. When some were salmon and some grey I thought she had paired with a heterozygous male, probably a member of the

same brood. If my female had really been *ab. aurata*, from the F_2 pairing, both parents salmon, all the progeny should have been salmon, but actually all were grey. I can have made no mistake, because I was not breeding any other *aversata*, and the larvae were counted each time they were fed, and the numbers were always those expected. The only explanation is that salmon is dominant to grey. The original female must have been heterozygous and had paired with a homozygous grey male, a pairing from which one expects a ratio of 1 : 1, salmon : grey. The actual result, 6 salmon : 10 grey is not far from that expected considering the small size of the brood. The F_2 pairing, salmon \times salmon, should have produced 3 salmon : 1 grey, for both parents must have been heterozygous for salmon. Since only three moths were bred, it is not very surprising that all were the grey recessive. The fact that any were grey is sufficient proof that salmon is dominant to grey.

I showed these moths to Mr L. B. Prout and he thought they might be examples of *ab. amoenata*, Fuchs (*ab. suaveolaria*, Fuchs). Fuchs (*Ent. Zeitung, Stettin*, 1901, **62**, 121) describes *Acidalia inornata* *ab. amoenata* from Sicily as "Sehr licht ockergelblich, rötlich getönt, Saum und Franzen lebhafter, fein ockerbräunlich bestäubt, mit undeutlichen Querlinien, aber deutlich schwarzem Mittelpunkt aller Flügel." A year later he renames it *suaveolaria* (*Jahrb. Nass. Ver. Nat.*, 1902, **55**, 73), saying that *amoenaria* has been used by Staudinger for a species of *Acidalia* from Ussuri. This however does not render *amoenata* invalid. In *Lepidopterorum Catalogus*, Pars **63**, p. 401, Mr Prout places *amoenata*, Fuchs, as an aberration of *Sterrhia aversata* on the authority of Püngeler, who purchased Fuchs' collection, and wrote saying it had been incorrectly identified.

In 1943 Mr L. Goodson caught a female *ab. amoenata* in his garden at Tring and kindly gave me the eggs, which were laid on 12th July. These produced 14 *remutata* and 22 *amoenata*. Most of the moths emerged, while I was away in London for two days, and although I obtained a large number of eggs, the parentage was uncertain, but all four female parents were *remutata*. The offspring consisted of *remutata* and *amoenata*. After I had come back I obtained two F_1 pairings, of which the parentage was certain, *amoenata* δ \times *remutata* ♀ (brood 2) and *amoenata* \times *amoenata* (brood 3), both of which produced moths in October 1943. An F_2 pairing (brood 4) was obtained between two *remutata* belonging to the broods of uncertain parentage and a number of *remutata* emerged from February to the end of May 1944. Another pairing (brood 5) was obtained in October 1943 between a male *remutata* from the broods of uncertain parentage and a female *amoenata* from the wild female and this produced 10 *amoenata* in June 1944. Two F_3 pairings (broods 6 and 7) were obtained in March 1944, but most of the eggs were infertile or failed to hatch, and two small broods of *remutata* resulted. The last successful pairing (brood 8), between a male *remutata* of brood 6 or 7 and a female *amoenata* of brood 5, was obtained in July 1944 and the moths emerged from December 1944 to March 1945. Unfortunately many of the eggs failed to hatch and about half the larvae died.

The results were disappointing. Some attempted pairings failed, at least four gave infertile eggs and pairing may not have taken place, though the eggs were laid quickly and in the normal way, and from a

pairing between a male *amoenata* and a female *remutata* many eggs were obtained, but only one egg was fertile and the larva soon died. The only occasion, on which I saw two moths paired was in June 1944. It was between a male *remutata* and a female *amoenata*, but all the eggs were infertile. Other pairings including several *amoenata* × *amoenata* gave a number of infertile eggs and in the successful pairings many of the fertile eggs failed to hatch.

The results, which are given in tabulated form, prove that the pink ab. *amoenata* is dominant to the grey ab. *remutata*. Both the wild female *amoenata* produced *amoenata* in the first generation, and this would be very unlikely to happen unless *amoenata* were dominant, the pink aberration being so very much rarer than the normal grey form.

	<i>Remutata</i> . ♂	<i>Remutata</i> . ♀	<i>Amoenata</i> . ♂	<i>Amoenata</i> . ♀	Brood number.
Wild <i>amoenata</i> ♀	3	7	3	3	—
F ₁ <i>Amoenata</i> × <i>amoenata</i>	1	2	—	—	—
Wild <i>amoenata</i> ♀	7	7	14	8	1
F ₁ <i>Amoenata</i> ♂ × <i>remutata</i> ♀	2	—	1	1	2
F ₁ <i>Amoenata</i> × <i>amoenata</i>	—	—	4	4	3
F ₂ <i>Remutata</i> × <i>remutata</i>	32	23	—	—	4
<i>Remutata</i> ♂ × <i>amoenata</i> ♀	—	—	3	7	5
F ₃ <i>Remutata</i> × <i>remutata</i>	5	6	—	—	6
F ₃ <i>Remutata</i> × <i>remutata</i>	5	2	—	—	7
<i>Remutata</i> ♂ × <i>amoenata</i> ♀	4	5	9	2	8

There is very little doubt that Mr Prout was correct in thinking that these pink *aversata* are ab. *amoenata*. All the females have the thorax and basal part of the forewings ochreous with a pinkish tinge, but the marginal area and the fringes are deep pink. In many of the males, especially in those of brood 8, the contrast between the basal and marginal areas is much less and the general colour is light ochraceous salmon (Ridgway). The colour of the females agrees very well with that of the type, which was described from a single Sicilian specimen. The aberration has not been recorded previously in the British Isles, and there are none in the long series of British and Continental *aversata* in the Tring Museum. It may have been mistaken for ab. *aurata*, which is evidently much commoner and occurs all over Europe including the British Isles and Sicily.

REDISCOVERY OF HALLODAPUS MONTANDONI, REUTER 1895 (HEM.: MIRIDAE).

By T. BAINBRIGGE FLETCHER.

In 1923 E. A. Butler added this species to the British List (" *Allo-dapus montandoni*, Reut. (Capsidae)—a British species": *Ent. Mo. Mag.*, LIX, 130-131, vi, 1923) on the strength of one male specimen taken in August 1897 at Swalecliffe, between Whitstable and Herne Bay, and of two males taken by J. Edwards at Colesbourne, Glos., 20.vii.1899 and 20.vii.1901, the latter a macropterous male taken at light. Since 1923 no further records of its occurrence seem to have been published.

In 1944 I found this species in restricted areas on Rodborough Hill, occurring tolerably commonly, so that on each of two occasions, 11 and 12.viii, I was able to take as many as 8 examples. The first specimen

was found on 28.vii, but, as this was a female, the species may have appeared earlier. The last specimen seen, on 21.ix, happened to be a male. In all, I came across thirty examples on fifteen suitable occasions (of which four produced none at all, and by "suitable" I mean the evenings of sunny days at a time roughly within an hour on either side, not of actual sunset, but of the sun's passing off the slopes on which the bug occurs). Searches in the morning and afternoon (before 16.00 G.M.T.) were fruitless: thus, on 12.viii a search in the morning (09.45-10.30) produced none at all, whereas an evening search in the same place (17.30-19.15) produced eight. In mid-August the best time was about 18.30 G.M.T. Its localities are sloping banks, usually facing the West, sparsely covered with small tufts of grasses, *Helianthemum*, *Hieracium*, etc., the soil being mostly small fragments of rock, often forming small bare patches on the plant-carpet, and it is on these bare patches that the bug is seen running about quite actively in the open and it is its rapid movement which at once differentiates it from an ant. When discovered, however, its motions, although rapid and erratic, are mainly short rushes in all directions, as if the bug were in a panic, within the limits of the bare patch on which it is found and, as often as not, the bug seems only too ready to walk up into a small box held down to it. I found that the best way to collect specimens was to scoop them up in a small box with all the surrounding *débris*, tip out the lot on to an outspread handkerchief, and then to rebox the bug as soon as it ran clear of the *débris*.

Although the sexes were found in approximately equal numbers (and all adults were brachypterous) I never found two individuals in any association with one another. Nothing is known of its biology but on 7.vi and 12.vi under similar conditions I found two young individuals, unrecognized at that time, but which are almost certainly immature *H. montandoni*. It occurs always in places where *Myrmica scabrinodis* workers are present and I think it probable that the bug is predaceous on this ant. Mr Butler (*l.c.*) wrote that "Mr Edwards thinks that it may have some association with ants, as his first specimen was on an ant-hill." At Rodborough there are many mounds of *Lasius flavus* in the place where the *Hallodapus* occurs but one rarely sees a *flavus* worker running about above ground as do the *scabrinodis*, and on the only occasion when I found a *Hallodapus* actually on a mound the only ants moving on the surface of the mound were *scabrinodis*, and no *flavus* were evident before breaking into the mound. I gave some fresh larvae and pupae of *Myrmica scabrinodis* to four *Hallodapus* (confined separately) and found (in three cases at least) that they were accepted and sucked by the bugs so readily as to give the impression that such was quite a familiar food.

I am much obliged to Mr W. E. China for kind confirmation of the identity of this bug.

WE understand that the Birmingham Natural History Society is shortly to restart the Entomological Section in the rooms of the Birmingham Photographic Society, York House, Great Charles Street. The time will be the last Friday evening in each month at 7 o'clock. We wish the Society success, and good support worthy of the Midlands.

COLLECTING NOTES.

THE FOODPLANTS OF PHEOSIA TREMULA, CL.—Mr P. B. M. Allan, in his remarks on the foodplants of this species, refers to a record by my son, Dr G. Heslop Harrison, of the occurrence of its larva on willow on the Isle of Eigg. I am quite unable to state which of the common willows is meant as both *Salix fragilis* and *S. alba* occur on the island as introduced plants. I can, however, supply a record of finding the larvae on another smooth-leaved *Salix* species, *Salix purpurea*, in my own garden, Birtley, Co. Durham. This plant belongs to a group of Salices not closely allied to the willows just named.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne.

OVIPOSITION OF ACHLYA FLAVICORNIS, L.—On 27th February this year some specimens of this moth emerged from pupae kept during the winter in a closed tin. They were all, of course, crippled but were quite lively, so would seem to have emerged not more than a day or two previously. They were placed in a muslin-covered box in my (heated) sitting-room, and during the night of 28th February-1st March ten eggs were laid on the muslin. During the succeeding day, while the sun was shining on the box, a further ten eggs were laid. It is known that this species occasionally flies in the sunshine, so it is possible that in the wild state oviposition takes place during the day as well as at night. Perhaps this is already known, but I do not recollect to have seen any mention of it, nor of the sexes of specimens netted on the wing in the daytime.—P. B. M. ALLAN.

REPUTED MIMICRY IN PARERONIA VALERIA, CR.: CONSIDERED WITH REFERENCE TO OTHER INDO-AUSTRALIAN PIERIDAE.—It was interesting to see Mr Sevastopulo's comments on this paper of mine (1944, *Entom. Rec.*, 56, 90-93) in the February 1945 issue of this Magazine; and I am glad to have his corroboration as to relative equality in numbers between the sexes in *Pareronia*. Col. H. D. Peile, in a letter to me, has expressed the same view, again based on first-hand observation in India. The apparent inequality does depend on different habits, due to the egg-laying duties of the females, as in various *Papilio* species (Wheeler, 1940, *Entomologist*, 73, 269-74).

I admit that there is a difference in speed between the sexes in *Pareronia*. But this only appears to support the mimetic hypothesis when this genus is considered solely with reference to Danaidae, as it is throughout Mr Sevastopulo's memorandum and the quotations he gives from two doctors (without according the title to myself). But if people neglect facts that do not accord with popular theories it is easy to fall into fallacies. As the full title of my paper stresses, *Pareronia*, in spite of various Danaine features, is a Pierid genus. As such, it shares characteristics found in many other Pieridae, besides the dark colour, relieved by white bars and yellow patches, in females. One such property is different speed in flight between the sexes, correlated with different wing patterns. In *Delias georgina*, *D. ninus*, *Appias libythea*, *A. nero*, and *A. lycida*, for instance, the females have more rounded forewings and a relatively slow flight, while their males have sharp apices and swifter flight (cf. Seitz, IX, Pl. 57, 57, 61), just as in *Pareronia*.

Might I also point out that "Malay" is an adjective, and the not unimportant country connected with it is called Malaya.—L. RICHMOND WHEELER, Ph.D.

CYLINDROTOMA DISTINCTISSIMA, MEIGEN, BRED (DIPT.: TIPULIDAE).—On 19.iv.1944 Mr H. K. Airy Shaw wrote from Daglingworth, Glos.:—"I enclose a very curious larva found on burdock (*Arctium*) leaves at Perrott's Brook yesterday. Is it a Sawfly? It has a curious habit of curling back both extremities when disturbed. Notice the row of curved processes along its back. I only saw the one specimen." This reference to a sawfly was evidently due to the larval habit, when disturbed, of curling upwards both extremities until they nearly met over the back, but obviously the larva was dipterous, although unknown to me, and I was at first rather sceptical as to whether it was actually a leaf-feeder; but this point was soon settled by giving it fresh *Arctium* leaves, into which it proceeded to gnaw patches on the upperside of the leaf. It continued to feed until 1.v, when it was found to have pupated and then it was evident that it was some Tipulid. The imago emerged on 9.v, and was identified as *Cylindrotoma distinctissima*, Meigen, of which the metamorphoses have been observed previously by several entomologists. Brunetti (*Fauna India, Diptera Nematocera*, pp. 360-361: 1912) says:—"The larva has the exceptional character of living on the undersides of the leaves of low-growing plants, like the caterpillar of a Lepidopterous insect. It is green, elongate, flattened, linear, only a little pointed at each end, with a longitudinal crest along its back, consisting of a row of fleshy processes pointing backwards: the lateral margin is broad, with many excisions, formed by fleshy points The larva, according to Schiner, feeds on *Stellaria nemorum*, *Anemone nemorosa*, and *Allium ursinum*. It is also found on *Viola*. Zeller (*Isis*, 1842, p. 808) gives a good description of the larva." My larva fed on the upperside of the leaf of *Arctium*, a foodplant not noted by Brunetti, and his fleshy points on the lateral margin were, according to my note, seven pairs of distinct pseudopods by which the larva clung to the leaf-surface.—T. BAINBRIGGE FLETCHER, Rodborough, Glos., 28.xii.1944.

TETBURY (GLOS.) NOTES, 1944.—According to reports I have received, 1944 seems to have been a disappointing year for the Lepidopterist in most parts of the country.

Prior to that year I had done most of my collecting in N.E. England, mainly, in Co. Durham, which holds a few treasures for the collector, but he has to work hard to get results. The season is short (summer generally occurring on Whit Monday!), and much time and expense has to be wasted in travelling. The greatest find there is that fascinating butterfly the "Brown Argus" (*Aricia agestis*), which probably shows more variation in Durham than anywhere in the country.

The year 1944 then, being the first I had spent in the south, was an eventful one for me. After ten years collecting in Durham, one full year in Tetbury, where I saw *Gonepteryx rhamni* and *Polygonia c-album* on the wing on 12th March, has to be experienced to be fully appreciated.

My hunting ground was an area within a 3-4 mile radius of Tetbury, and there I identified 38 species of our butterflies including *Hamearis lucina*, *Limenitis camilla*, *Thecla quercus*, *Strymon w-album*, *Maniola tithonus*, and *P. c-album*. The migrants, as elsewhere it appears, were scarce, although *Vanessa atalanta* was abundant, in the autumn brood.

Fallen plums proved a powerful attraction to this butterfly as it did also to *P. c-album*. I saw only one *Vanessa cardui* (11th July) throughout the year, and not a single *Colias croceus*.

With few exceptions, my collecting of Heterocera would not be of particular interest to the regular south country collector, but it was a great pleasure to me to see for the first time "in the flesh" such species as *Panaxia (Callimorpha) dominula*, *Diloba caeruleocephala*, *Anchoscelis helvola*, *Boarmia roboraria*, *Euphyia silaceata*, and *E. hastata*.

The discovery of *Hydraecia petasitis* (larvae) and *Ennomos autumnaria* in Tetbury, I think, deserves special note. According to some authorities *petasitis* is regarded mainly as a north country species, occurring wherever its food plant, Butterbur (*Petasites vulgare*), is abundant. However, in spite of diligent search, over a number of years in various parts of Co. Durham, where the plant is common, I failed to find the insect. Nor did I ever meet anyone with knowledge of it. It was, therefore, of particular interest to me to discover the larvae at Tetbury in April 1944.

Anticipating some of the possible difficulties in rearing this species I decided to experiment with two larvae only. They fed on the rhizome of Butterbur which I kept in a shallow glass dish covered by a glass lid. This served to keep the root fresh and moist and it was necessary only for me to renew the rhizome about every two weeks. All went well until the end of July when I expected the larvae to pupate, but for some reason unknown to me, one died. The other is fully grown and still alive (12th January 1945) apparently hibernating in what is now a somewhat decayed Butterbur rhizome! I would be glad to hear from anyone else who has had experience in rearing this species.

On 23rd August I was very surprised when a friend brought me a female *E. autumnaria* alive, and captured in Tetbury. I was fortunate in getting a large batch of eggs from her before she died. All reference I have relating to this species seem to give it as local and confined more or less to the south and south-east counties. There is no mention of it in Donovan's *Catalogue of the Macrolepidoptera of Gloucestershire* (1942) so, think it may be a notable find, and probably a record.—J. NEWTON, B.Sc., "The Retreat," Tetbury, Glos., 12th January 1945.

AMATHES AGATHINA, AB. **virgata**, AB. NOV.—The ground colour is pale pink tinged whitish-grey, the usual markings just discernible in darker grey.

The inner and outer lines are complete and stand out strongly in blackish-grey. The whole area between these lines is dull grey, except on the costa, which is wholly of the pale ground colour.

The deeper grey colour is confined to the central fascia, and does not spread out beyond either toward base or outer margin, so that the dark band is clearly defined.

The black subcostal streak which reaches the reniform and contains the orbicular is present, but less black than normal.

The orbicular is represented by a mere dull white pinpoint, the reniform is normal.

This extremely pale darker banded form was bred from a larva taken in North Wales, and emerged August 1908.

Type ♂. Penmaenmawr, 1908. Robert Tait.—A. J. WIGHTMAN.

CURRENT NOTES.

WE regret to announce the passing of one whose name was well known to every reader of our magazine, but who personally was known only to very few of the older people. Mr H. E. Page passed away after an operation. In November last Mrs Page was knocked down in the street while waiting to board a bus and sustained a severe injury from which she did not recover. No doubt this was a great shock to her husband, who for some time had been suffering from kidney trouble; his doctor said an operation was needed and from this he failed to find relief and he died early in March. From the commencement of the magazine he was closely associated with J. W. Tutt, the founder and editor, in the business side, and after Tutt's death he continued his management with the aid of a panel of editors until some 20 years ago, when the present arrangement was initiated. Mr Page was of rather a retiring nature, kind and friendly in disposition, helpful to all those who knew him. In addition to collecting in the homeland, he and Mrs Page visited Switzerland, S. France, the French Alps, Spain, etc., and latterly since his retirement a few years ago he became interested in the Rhopalocera of S. America. Some of us will miss him much.

WE have to announce another change in the *Ent. Record*. Mr Wm. Fassnidge, M.A., F.R.E.S., has kindly consented to join our panel of Editors. He is already well known to many of our readers as the Treasurer of the Society for British Entomology. We welcome him as a keen entomologist, an excellent field worker and an extremely well-informed colleague.

THE Imperial Chemical Industries have just produced an Insecticide which is claimed to be one of the most effective and deadly to what is considered the worst pests we have, viz., the locusts, and is a certain palliative against the attacks of other insects. Recently Dr Roland Slade has been demonstrating its use and value in a lecture to the Society of Chemical Industry. The use of this insecticide may be extended to lice and fleas, and it has proved equally toxic in disinfecting rooms. The weevil family of beetles is well known to produce quantities of predators and against them this substance is found to be more effective than any other known insecticide.

THE Collection of British Coleoptera left by the late Mr H. Willoughby Ellis was sold for £500, and has gone to the York Museum.

His collection of Lepidoptera was bought by Messrs Watkins of Doncaster for £1250. We understand it will be put up for sale again shortly.
—HORACE DONISTHORPE.

CORRECTION.—In Vol. LVI (1944), on p. 97, in the Title delete "VI." On p. 114, in lines 23 and 28 delete "VI."

the ♂♂, without, however, becoming the colour of ab. *latenai*, Pier. There lie before me numerous specimens (chiefly ♂) of the above-named form. The examples from Zijeb (Penth.) belong to this subspecies, just as the single ♀ of the above from Bosnia (Treskavica Pl.) as well as a ♂ from Musaliah in Bulgaria" (24-26, VII, 1930, Zerny.).

ab. *brunnescens*, Schaw., *Zts. Oest. Ent. Ver.*, XXIII, 26 (1938).

ORIG. DESCRIP.—After referring to the "blue-grey" typical form and the black-brown *latenai* he said: "Besides these two colours there occurs the brown colour form, which occurs especially in the East, Burgenland, Bukowina, Kroatia, and also in Hungary as a racial form of the species. This brown form, should according to Spuler, also occur at Erlangen as an aberration. I saw more from Germany and one very fine brown female from Hochschab in Stiermark, in the Vienna Museum."

ab. *canescens*, Schaw., *Zts. Oest. Ent. Ver.*, XXIII, 26 (1938).

ORIG. DESCRIP.—"The white-grey examples, which have little or no black, might bear the name *canescens*. On the Gran Sasso in the Abruzzi this form may occur as a race. But I do not know." The two types are in the Vienna Museum.

race *hawelkae*, Schawerda, *Zt., l.c.*, p. 41 (1938).

ORIG. DESCRIP.—"Of the remarkable races of the Balkan mountains a somewhat smaller one has been obtained from Kroatia which I have named from its discoverer Herr Hawelka, ssp. *hawelkae*. The 7 ♀♀ lying before me are all of a sooty grey-brown, 6 of them as well as 2 ♂♂ have clear fringes, the discal area and the margins of the stigmata are apparent. The forewings are markingless dusky grey-brown. The black and white small spots on the costa and the white submarginal dentate line are not present. All suggestion of black or white is absent. In the 7 ♂♂ and one ♀ there is somewhat more of the black remaining in the middle area."

ab. *littoralis*, Schawerda, *Zt., l.c.*, 41 (1938).

ORIG. DESCRIP.—"In the Zengger *dentina* has the stigmata and the outer area not white, but grey as in ab. *reducta*, clear grey as the ground colour. The markings in the discal, costal and marginal areas are ringed with blackish. I name this, the smallest known form, var. *littoralis*."

var. *gredensis*, Schawerda, *Zt., l.c.*, p. 42 (1938).

ORIG. DESCRIP.—"A clear white-grey, like the normal sized form but only 33-35 mm. in expanse. The Austrian alpine form is 35-37 mm. in expanse. The black marking is not so intense, but yet in evidence. As in other small races it has strongly whitish-grey ground, at the base more suffused than on the marginal area. Thus it resembles the Balkan race *reducta* but is larger and much more white-grey." Sierra de Gredos.

var. *nevadensis*, Schawerda, *Zt., l.c.*, 42 (1938).

ORIG. DESCRIP.—"The ground colour here is not white-grey as in *gredensis*, but more grey-brown. The black in the discal area is rudimentary. The whole forewing is brownish. The small, light margined brownish stigmata have only a slight trace of yellowish under the cell. The marking is quite good and well developed, and forms with the trans-

verse dentate line the surround of the discal area; the base and the marginal area of the insect form another contrast where the brownish ground colour and the absence of black and white are exhibited quite readily." Sierra Nevada.

ssp. *sultana*, Schwing., *Ent. Rund.*, LV, 224 (1938).

ORIG. DESCRIP.—"Noted at once by their frail structure, small size (cf. *serena*), the light grey colour, obsolescent and restricted markings and narrow wings. But it is difficult, in a species so variable and proportionately less characteristically marked to include the slight differences in a description good enough for identification. Since all the males are alike and also frail, they can be distinguished. I name them *sultana*." Comes near *reducta*, Rbl.-Zerny. Anatolia.

Hadena, Schrank. (1802), Dup., Gn., Newm., Barr. [*Melanchra*, Hb. (1820), Meyr., Meyr.: *Mamestra*, Hb. (1821), Steph., Stdgr., Splr., South, Culot: *Polia*, (Ochs.) & Tr. (1816-25), H.-S.: *Scotogramma*, Smith (1887), Hamp., Warr.-Stz., Drdt.-Stz.] *trifolii*, (Rott.) (1776), Hufn. (1766) [*chenopodii*, Fab. (1787), Schiff. (1775)].

Tutt, *Brit. Noct.*, III, 82 (1892): Meyr., *Handbook*, 82 (1895): Barrett, *Lep. Br. Is.*, IV, 199, plt. 159 (1897): Stdgr., *Cat.*, IIIed., 188 (1901): Hamp., *Lep. Phal.*, V, 28, fig. (1905): Splr., *Schmett. Eur.*, I, 173, plt. 37, 8 (1905): South, *M.B.I.*, 245, plt. 122, 3-4 (1907): Warr.-Stz., *Pal. Noct.*, III, 68, plt. 15g, h (1909): Culot, *N. et G.*, I (1), 104, plt. 17, f. 17, plt. 18, 4 (1911): Meyr., *Rev. Handb.*, 152 (1928): Drdt.-Stz., *Pal. Noct. Supp.*, III, 96 (1931).

Ernst & Engram., *Pap. d'Eur.*, VII, 107, fig. 485b (1791), which Fab. named *tristis*, *Sys. Ent.*, p. 617 (1775), but which Wernb. and others identified as *trifolii*, Hufn. This it much resembles, but 485a is certainly not the same species.

Schiff., *Verz.*, O. 82 (1775), gave this species the name *chenopodii*. This Illiger, *Verz. ausg.*, p. 291 (1801), followed and cited Fab., *E.S.*, III, 2; Bork., *Naturg.*, IV, 418, and Esp., *Abbild.*, IV, plt. 181.

Rottemberg, *Naturf.*, IX, 131 (1776), in dealing with the *trifolii*, Hufnagel, *Berl. Mag.*, III (1766), cited Rosel's figure, *Ins. belust.*, I, 2nd plt., p. 48. His criticism only concerns the figure of the larva in Rosel. Thus Hufn. is the author of *trifolii* (1766).

Esp., *Abbild. Noct.*, IV, 505, plt. 152, 15 (1787-?), gave a figure he named *saucia*, a pale yellow ground colour, which seems a form of *trifolii*. On plt. 181, figs. 2 and 3 (1790+), he gave ♂ and ♀ of *chenopodii*, much lighter than we usually know. On plate 117, 5 and 6 (1788+), he gave a ♂ and ♀ of an insect he named *verna*, which has been considered *trifolii* by Werneberg.

Bork., *Naturg.*, IV, 418 (1793), described and discussed it at length and cited the *trifolii*, Hufn. (1766), and Rosel's fig. of *chenopodii*.

Hb., *Samml. Noct.*, 86 (1802), gave an excellent figure of the typical form *chenopodii*. He also figured *pugnax*, f. 726, which is now treated as a species; subsequently Geyer 850 figured *treitschkei*, which is a large *trifolii*; a very good figure.

Haw., *Lep. Brit.*, 192 (1806), in his treatment of *chenopodii*, Fb., gave two aberrations: (1) *pallidior*, "stigmata claviformi multo minore;" (2) *Alis saturatoribus*, *striga postica* obsoletiore.

Dup., *Hist. Nat.*, VI, plt. 102, f. 3 (1826): VII, p. 31 (1827), gave an excellent figure of the typical form under the name *chenopodii*. He referred to the *trifolii*, Hufn. In *l.c.*, VII, 40, he dealt with *treitschkei*, of which he gave a good figure on plt. 103, f. 1 (1827). He expressed the fact that it was very close to *chenopodii*.

Treit., *Schmett.*, V (2), 144 (1827), dealt with this species under the name *chenopodii*; he recognized it as the *trifolii* of Hufn. and of Rott., and the *verna* and *saucia* of Esper. He gave an excellent life-history of the species, and stressed its close affinity to *oleracea*.

Steph., *Illus.*, II, 195 (1829), treated this species under the name *chenopodii*.

H.-S., *Sys. Bearb. Noct.*, II, 254 (1846), treated of *chenopodii*, and of *farkasii* as a separate species. He gave a figure, 390 (1849), which has a strong band across the disc of the forewing, of which in the typical form there is no indication.

Gn., *Hist. Nat.*, VI, 97 (1852), treated *verna*, Esp., and *saucia*, Esp., as one and the same and as synonyms of *chenopodii*, Albin. He considered *farkasii*, Tr., and *treitschkei* as two good species.

Newman, *Brit. Moths*, 416 (1869+), described this species under the name *chenopodii*. He gave a figure not of the typical, but of a banded form with the stigmata unusually large.

Meyrick, *Handbook*, 82 (1895), called this species *trifolii*, Rott., and used the genus *Melanchra*; in the *Revised Handb.* (1928) he used the same genus.

Barrett, *l.c.*, V, p. 199, plt. 159 (1897), gave four figures, none of which have the general colour and appearance of typical *chenopodii* (*trifolii*). The "dull brown" is much too dark, in which the yellow infusion dominates the grey completely. 2c, depicts an extreme yellowish form.

Stdgr., *Ent.*, IIIed., 158 (1901), used the name *trifolii*, Rott., with *chenopodii* as a Syn. as well as *treitschkei*. He took *farkasii* as an ab. "obscurior, medis variegata."

Hamp., *Phalaena Noct.*, V, 28 (1905), used the name *trifolii*, Rott. (=Hufn.), treated *chenopodii*, Schiff. as a synonym, with four abs., and eight other names as synonyms. His abs. were *farkasii*, *oregonica*, *treitschkei* and *albifusa*. Of the eight syns. *saucia* was treated as an ab. by Tutt; *pugnax*, a sp. in Seitz; *intermissa*, also a sp.; *inquieta*, a sp.; *glaucovaria*, an American sp.; *canescens*, a form of *brassicæ*; *oregonica*, a Syn. or a sp. Amer. He ignored the *indistincta*, Tutt.

Splr., *Schmett. Eur.*, I; 173, plt. 37, 8 (1905), noted ab. *saucia*, Esp., ab. *farkasii*, Tr., and gave a good figure of typical *trifolii*.

South, *M.B.I.*, I, 245, plt. 122, 3-4 (1907), gave two very good figures of the typical form. There is no indication of a band in either figure.

Warr.-Stz., *Pal. Noct.*, III, 68, plt. 15g, h (1909), gave *chenopodii*, Schiff., *verna*, Esp., and *treitschkei*, Hb., as Synonyms. The *treitschkei*, Bdv., they placed to *pugnax*, Hb. (a species), as a syn., and *canescens* as a form of *brassicæ*, only to be found in S. France. The only forms recognized by them were *albifusa*, Walk., and the four forms they figured, typical 15g, *saucia* 15g, *farkasii* 15h, and *indistincta* 15g.

Culot, *N. et G.*, I (1), 104, plt. 17, f. 17, plt. 18, f. 4 (1911), gave a very good figure of a typical form on plt. 17; and on plt. 18 a figure of the small form of *N. Africa*, *turatii*, which he discussed at some length; at first he had treated it as a species, but on the advent of intermediates he subsequently treated it as a race of *trifolii*. The *treitschkei*, Bdv., he treated as a good species.

Draudt-Stz., *Pal. Noct. Supp.*, III, 96 (1931), described *zermattensis*, nov. f., gave a better figure of *farkasii*, 14a, described f. *brunnescens*, Heyden, a dark coastal form, and *cinnamomeana*, Roth, the less grey Algerian form, 14b, and perhaps *fruticosae*, Dumont, from Tunis. *l.c.*, p. 252 (1937), and *lodbjergensis*, Hoffmeyer and Knud., from Jutland.

Of the Variation Barrett writes:—

“Slightly variable in the tone of colour of the forewings, from yellowish-brown to dull umbreous, and in the degree of dark marbling and marking; occasional specimens having them almost or quite suffused with dark umbreous till hardly any markings are visible and even the subterminal line is obscured. On the other hand those possessing the paler ground colour frequently have the reniform stigma very dark, or else there is a broad shaded darker central band, broad at the costa, tapering off to the middle of the wing, and thence to the dorsal margin very narrow. Dr Mason has a specimen very curiously smeared with dark brown and having the markings almost obliterated; in the collection of Mr Sydney Webb is one of the smooth rich yellowish-fawn colour seen in *Apamea basilinea*. But probably the most interesting form yet met with here is a specimen taken by Colonel Partridge, at the Isle of Portland, on the night of 15th August 1888. It was recognized as a form known in N. America as *H. albifusa*, Grote; and was supposed to be a distinct species. Information received from Prof. T. B. Smith, of Washington, and subsequent examination of long series in the National Collection, has dispelled this idea and proved the specimen in question to belong to the present species; but with the exception of this single specimen, this peculiar variety does not seem to have been observed in the Eastern Hemisphere. The orbicular stigma in it is large and whitish, the reniform also large, dark grey, with a perpendicular pale shade down its middle; the claviform very broad, almost lunate, grey-edged with black; from the whitish orbicular stigma a pale oblique stripe meets, near the anal angle, another broad pale stripe from the apex of the wing. These pale bands give it a very singular appearance. In the United States this form appears to be common, becoming even more strongly marked than the Portland specimen, while all the intermediate shades of colour and marking between these and the ordinary typical examples are found.”

“Since writing the above I have received from my sister, and captured by her, at Annshaw, S. Africa, examples of this species, having the middle area of the forewings patched and clouded with pale ochreous, and with a blotch of the same outside the reniform stigma.”—C. G. B.

The Forms and Names to be considered:—

trifolii, Hufn. (1766), *Berlin Mag.*, III.

chenopodii, Schiff. (1775), *Verz.*, 82. Syn.

trifolii, Rott. (1776), *Naturf.*, IX, 131.

chenopodii, Fb. (1787), *Mant.*, II, 186. Syn.

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Wanted—American Hesperilidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write K. J. Hayward, Instituto Miguel Lillo, Calle Miguel Lillo 205, Tucuman, Republica Argentina.

Duplicates—*Rhopalocera* from China and Peru, in papers, perfect condition, with data. **Desiderata**—Similar material except from North America.—John W. Moore, 151 Middleton Hall Road, King's Norton, Birmingham, 30.

Desiderata—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.

Wanted—*Lycaena* (*Heodes*) *phlaeas* from all regions including British Isles. Also wanted other species of Chrysophanids from all areas. Exchange or purchase considered. **Duplicates**—Foreign Lepidoptera, e.g., Satyrids, Charaxes, Papilios, and others; full lists sent.—P. Stutter Smith, 66 Stirling Road, Edgbaston, Birmingham, 16.

Desiderata—Frohawk, F. W. "Varieties of British Butterflies" (1938). Buckler's British Larvae ('86-'01). For disposal, "Entomologist's Record," complete, Vols. 1-28 hlf. cf., 29-55 wrappers.—A. F. L. Bacon, The Malt House, Burghclere, Newbury.

Wanted for cash or exchange many species of ova, larvae and pupae, including *A. grossularata* larvae in large numbers. Offers also Tutt's British Lepidoptera, vols. 1, 2 and 3; Barrett (small edition), vols. 3, 4, 5 and 6; Tutt's British *Noctua* and their Varieties, vols. 2, 3 and 4.—Pickard, 36 Storeys Way, Cambridge.

Wanted—Various monthly parts of *Entomologist's Record* for 1914, 1915, 1916, 1917, 1919, and 1920. Please report any odd monthly parts (in wrappers as issued) prior to these years.—P. B. M. Allan, Aberhafesp, Newtown, Montgomeryshire.

Wanted—*Pieris napi*, varieties, local races, or any unusual forms. Also drawings on loan, or particulars of same, for figuring. Will exchange or purchase.—J. Antony Thompson, Bishopswood, Prestatyn, Flintshire.

Wanted—Aberrational forms of *Maniola tithonus*. Purchase or exchange considered.—S. G. Castle Russell, Springetts, Seaview Road, Highcliffe-on-Sea.

Wanted—Males of *Morpha menelaus*, *M. didius*, *M. rhetenor* in papers.—Leonard Tatchell, 121 King's Road, W., Swanage, Dorset.

Wanted—Binocular Microscope, second-hand, for entomological purposes.—E. S. Brown, Hailey Lodge, Hertford Heath, Hertford.

Wanted urgently for experimental purposes, pupae of *betularia*, *porcellus* *elephanor*.—Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.

Wanted for purchase or exchange, pupae of *Smerinthus populi*, even a few would be welcome.—Capt. E. S. A. Baynes, F.R.E.S., Monkshatch Cottage, Compton, Guildford, Surrey.

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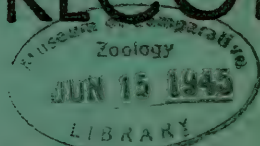
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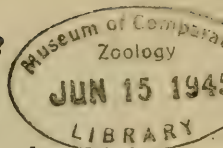
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IS THE DIAPAUSE IN INSECTS ERADICABLE?

By E. P. WILTSHIRE, F.R.E.S.

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Cousin's experimental study on the diapause in insects is the chief work on this subject. It deals principally with Diptera. Experiments by others on Lepidoptera are also quoted in it, and Cousin reconciles these with the conclusions he forms from his own experiments. He is doubtless right in regarding the diapause as a phenomenon equally developed and equally capable of study in different Orders of Insects.

Cousin's experiments showed that the diapause, as observed by him—whether hibernation or aestivation—is the consequence of unfavourable external conditions rather than heredity; and he concluded that a diapause can be eliminated by rearing several generations in optimum conditions, each species having its own optimum, to which, he states, natural conditions rarely if ever approximate. He expressly warns us against judging a species by its natural behaviour.

There are innumerable Lepidoptera, with a long strong diapause in a state of nature which might be cited as warranting objection to Cousin's conclusions, but his warning against argument from natural behaviour (a warning which is perhaps not admissible) requires us to experiment with breeding these species over several generations and trying to find their optimum conditions. The warning, in effect, obliges any prospective opponent to his views to contest them with weapons of Cousin's own choosing; it imposes inevitably a considerable delay on the prospective opponent, if it does not actually prevent him altogether from venturing on to the field. Meanwhile, until the necessary protracted experiments can be made and published, the fallacy in Cousin's conclusions needs pointing out, to prevent the other side's case going by default.

The fallacy lies in the fact that Cousin *selected* his subjects. He selected them for their suitability for experimental breeding. For this purpose the most suitable subjects are continuously-brooded species with a short life cycle; and Cousin's selections are indeed all continuously-brooded species (e.g., *Lucilia sericata*, Meig., *Calliphora erythrocephala*, Meig., *Phormia groenlandica*, Zett., and *Mormoniella vitripennis*, Walk.). Cousin uses the term "poly-voltine" for this type of phenology; to a purist, "multi-voltine" would be a preferable word.

Yet the multi-voltine or continuously-brooded species are those in which the diapause is weakest; small wonder that a study of the diapause in these insects should lead the author to conclude that it is a reaction to external circumstances rather than a fixed inherited factor. The longest diapause he succeeded in producing in *L. sericata*, his main subject, was of less than a month. The extreme cases in nature, however (to omit mention of cases of "overlying" for more than a year), have a diapause lasting nine or ten months (e.g., *Simyra dentinosa*, Stgr., *Cucullia strigicosta*, Bours., *Cucullia fauicicola*, Wilts., *Epitherina rhodopoleos*, Wehrli, *Itame berytaria*, Stgr., etc.). These extreme cases, and the cases of pupal rest prolonged over a year or more, are of "uni-voltine" or single-brooded species. A study of the diapause in insects should surely concentrate on univoltine species. Jarvis' study, therefore, though less thorough-going, is superior to that of Cousin because it distinguishes better between species with different phenologies, and also, of course, because of its bio-chemical approach.

I have found that the diapause is strongest in species restricted to the more arid parts of the world, i.e. the Southern Palaearctic or Sub-Tropical rather than the Northern-Palaearctic or Euro-Siberian, and presumably also in the Tropical (i.e. regions within the Tropics with a distinct dry season) rather than the Equatorial (i.e. regions close to the Equator with a more distributed rainfall) climatic regions. The extreme cases are mostly desert or steppe species. In these areas a strong diapause (aestivation) occurs in many insects with more than one annual generation, but is longest and most obstinate in the single-brooded (univoltine), i.e. I have found that the diapause in some bi-voltine (two-brooded) species is broken down to some extent by breeding conditions differing from the natural. The phenomenon of hibernation, on the other hand, which is so marked in the Euro-Siberian Zone, and may occur twice or even more often in one life-cycle in Sub-Arctic climates, may be of a different bio-chemical character from the diapause produced by heat and aridity.

The very fact that the species with the strong diapause are restricted to regions with a generally unfavourable climate points to the probability that their diapause is inherited and uneradicable, otherwise we would expect to find them also inhabiting the more favourable climates. Alternative possible reasons for their limited range are foodplant-specialization (extreme monophagy) or one of those mysterious biological conditions to which we refer when we say that a species is past its climax or no longer has the impulse to extend its range. Without going here into cases and details, I consider both these alternatives less likely as explanations of the restricted range of these species than a rigid life-cycle (i.e. *inter alia* an obstinate diapause) combined with stenoecism (no tendency to migrate) and a lack of ecological tolerance.

The following Lepidoptera are quoted by Cousin:—*Carpocapsa pomonella*, L., *Lasiocampa quercus*, L., *Dendrolimus pini*, and *Pyrausta nubilalis*. For these he quotes the conclusions reached by Pictet and Babcock. Pictet states that after six generations bred at 22° C., *quercus* loses its diapause entirely; *pini* is said to react similarly. Whether this experiment proved lethal to any number of larvae is not stated. *Quercus* is the only univoltine species mentioned in the whole of Cousin's article with any details of experimental results. Yet it is not a good example for studying the diapause, for its hibernation seems to be a mere retardation by cold, and not a true diapause such as Jarvis designated as "true hibernation" (Jarvis found that "true hibernators" when hibernating did not react to heat by resuming their vital process). The choice of a uni-voltine species with a more rapid rate of growth than *pini* or *quercus* and a "true hibernation" might have produced different results from those reported by Pictet. Babcock's results with *nubilalis*, as given by Cousin, are of considerable interest. This species, of considerable economic importance, seems to be what in previous articles on phenology I have classified as "partly two-brooded." I gave as a type of this class *Notodonta ziczac*, L. Babcock found that "under normal conditions" 14% *nubilalis* larvae were univoltine, and that under hot dry conditions this proportion increased to 72%. This showed that heat and aridity strengthened the diapause, but that the diapause was still "normal" under more favourable conditions.

Cousin's experiments themselves cannot be contested; the general conclusions he draws from them are probably valid for all insects with

phenologies similar to those on which he experiments; the experiments reveal the probable way in which the diapause has evolved from the most primitive multivoltine phenologies, parallel with the evolution of the biological alternative, migration; but the general conclusions cannot, in my view, be applied generally to all insects, and especially not to those in which the diapause has developed most strongly. Indeed, I also doubt whether a marked diapause can be artificially produced in multivoltine species which have evolved, as an alternative, the migratory tendency in response to unfavourable environments. In fact, I consider Cousin's conclusions more applicable to the evolving species, those whose phenologies are still rather fluid, than to the fully-evolved species.

In all my ten years of breeding Lepidoptera in the Middle East, only once did a single-brooded species with a long diapause emerge out of season; that was when a pupa of *Cucullia lychnitis*, Ramb., produced an adult one month after pupation instead of waiting till the following Spring. Individual exceptions like this admittedly occur, but are not evidence that *lychnitis* would, if experimented on, cease to be univoltine.

I believe that the question could be settled in Britain without recourse to experiments on the extreme cases, which, being Sub-Tropical, are difficult for British entomologists to obtain. I appeal therefore to British breeders of Lepidoptera to make experiments on *Anthocharis cardamines*, *Thera rupicaprararia*, *Cheimatobia brumata*, *Amathes lychnidis*, *Brachionypha sphinx*, and other species with similar phenologies. I believe that it will prove impossible to eradicate the diapause of these species in the way Cousin thought possible. I should also like to see confirmation of Pictet's experiments with *quercus*. And if any breeder has already made observations relevant to this discussion, I hope he will report them at once without waiting to make elaborate and protracted experiments.

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IRISH LEPIDOPTERA COLLECTING IN 1944.

By BRYAN P. BEIRNE, Ph.D., M.R.I.A., F.R.E.S.

1944 was a bad year for Lepidoptera in Ireland. There was a deplorable scarcity of even the commonest species, and this was particularly noticeable amongst the Geometers. For example, ten hours' collecting in a good locality in Abbeyleix on 22nd July produced only six species. However, the marsh Lepidoptera were at least as numerous as usual, some species, for example *Aphantopus hyperantus*, being exceptionally common. Nevertheless, the season's collecting produced at least two species new to the Irish list and 119 new county records. The latter figure is not as impressive as it sounds, as the majority of these records are from Co. Leix, from which virtually no previous records

exist. The new county records are marked with asterisks in the following list. Collecting was carried out in Dublin and Wicklow, and, as most of the records are new localities for the species, they are listed in full below. During July a visit was paid to Co. Leix, where many interesting species were discovered, and to Co. Tipperary to discover if the colony of *Chrysophanus (Lycaena) dispar*, established there by Capt. Bagwell Purefoy in 1914, still survived.

The identifications of the species of *Hydraecia* and of the majority of the Microlepidoptera were confirmed by examination of the genitalia. I am grateful to Mr T. Bainbrigge-Fletcher for his opinion on some of the species.

A visit to Calary Bog, Co. Wicklow, on 29th May produced only *Eucosma pflugiana* and *Enarmonia succedana*, but owing to the high wind collecting was difficult. On the evening of 30th May I visited a locality at Foxrock, Co. Dublin, where some interesting species were found during the summer. The locality is an area of waste land, beside the golf course, with large clumps of Blackthorn and Gorse and numerous small ponds. The evening was dull and windless and good for collecting. Nine specimens of rush-feeding *Eupista* taken at random turned out on examination of the genitalia to comprise three *caespiti-tiella* and six **agrammella*. Another interesting species taken was *Cataplectica auromaculata*, the third Irish record and the first from Co. Dublin since Shield found it at Howth in 1853. Other species noted were *Epirrhoë alternata*, *Ancylis badiana*, *Argyroploce pruniana*, *Enarmonia succedana*, *Glyphipterix thrasoniella*, *Eupista albicosta*, *Monopis rusticella*, *Tinea cloacella* and *T. ganomella (lapella)*. A further visit on 11th June produced no additional species but on the evening of 20th June the following additional species were noted: *Colostygia pectinataria*, *Crambus hortuellus*, *Scoparia dubitalis*, *Euxanthis zoegana*, *Noto-celia suffusana*, *Argyroploce aemulana*, *Eucosma pflugiana*, *Bryotropha terrella*, *Elachista cygnipennella*, *Swammerdamia caesiella*, *Eupista glaucicolella* and *Tischeria marginea*. On 29th June *Blastoducna atra*, *Cnephasia incertana*, **Argyresthia retinella*, *A. nitidella* and *Eupista albicosta* occurred in the same locality.

17th June was sunny but very windy and a visit to Kilmacanogue Marsh, Co. Wicklow, produced only common species. Several *Leptidea sinapis* were taken, and *Procris statices* was very common around the edges of the marsh. *Callimorpha jacobaeae*, *Procus fasciuncula*, *Euphyia bilineata*, **Crambus hortuellus*, *Cnephasia virgaureana*, *C. incertana*, *Eucosma pflugiana*, *E. subocellana*, *Argyroploce nubiferana*, **A. lacunana*, *Glyphipterix thrasoniella*, *G. cramerella*, *Micropterix aruncella* and *M. calthella* were also noted.

On 22nd June I visited Dalkey Island, a small island off the south-east corner of Dublin Bay, from which no previous records for Lepidoptera have been published. The day was sunny but very windy, and most of the species taken were found in the crevices of the cliffs on the sheltered side. The best capture was **Aristotelia tenebrella*, previously recorded only from Wexford and Kerry. *Polychrosis dubitana (littoralis)* was common among the rocks on the shore of the northern end of the island and *Plutella annulatella* frequent along the cliffs. Other species taken were *Zygaena filipendulae*, *Polyommatus icarus*, *Crambus hortuellus*, *Scoparia dubitalis*, *Tortrix paleana*, *Hemimene petiverella*,

H. plumbagana, *Bryotropha terrella*, *Elachista cygnipennella*, *Eupista spissicornis* and *E. apicella*. On the evening of the same day some collecting was done along a lane and in the fields between Ballybrack and Cabinteely, Co. Dublin. Here *Eupista agramella* was taken, and *Borkhausenia minutella*, the fourth Irish record for the latter species. Other species were *Sterrhia aversata*, a strongly-marked form of *Euphyia bilineata*, *Crambus pratellus*, *Scoparia dubitalis*, *Tortrix consimilana*, *Cnephasia virgaureana*, *Eucosma cana*, *Argyroptero lacunana*, *Bryotropha domestica*, *Plutella maculipennis* and *Tinea cloacella*, all common Irish species. Additional species noted in the same locality on 1st July were *Rivula sericealis*, *Aphomia sociella*, *Euxanthia humana*, *Telphusa vulgella*, *Glyphipterix thrasoniella*, *Elachista cygnipennella*, *Eupista glaucicolella* and *E. gryphipennella*, the third Irish record for the last species, and on 13th July *Argyresthia nitidella*. In the fields at Finglas, Co. Dublin, on 3rd July *Tortrix consimilana*, *Cnephasia virgaureana*, *Bryotropha terrella*, *Blastodacna atra*, *Argyresthia nitidella* and *Swammerdamia lutarea* were taken. A further visit to Foxrock on 7th July produced the following species not previously found there: *Aphantopus hyperantus*, *Rivula sericealis*, *Eupithecia centaureata*, *Alcis repandata*, *Phlyctaenia lutealis*, *Agonopterix costosa*, *Argyresthia albistria*, and *Parornix scoticella*. The *A. repandata* was a dull blackish form, approaching the ab. *nigricata*, Fuchs.

Paltodora cytisella, **Phthorimaea artemisiella* and **Stomopteryx vorticella* were taken on the cliffs of Bray Head, Co. Wicklow, on 15th July. The last species has been recorded previously only from Kerry. On the heaths of Bray Head several *Alcis repandata* were seen flying slowly and heavily. When captured they were found to have several red mites fastened on to the thorax. A similar infestation of *Eupista glaucicolella* was noted later in the month at Abbeylisle. Newly-emerged *Lyncometra ocellata* and a few *Lampronia luzella* were also taken on Bray Head. Later in the evening of 15th July several interesting species were taken along the disused stretch of railway-bed on the coast about a mile south of Killiney Station, Co. Dublin. These included *Zygaena filipendulae*, *Scoparia dubitalis*, *Ancylis badiana*, *Eucosma cana*, *Argyrotoxa conwayana*, *Elachista consortella*, *Argyresthia albistria*, *Eupista discordella*, *Lithocolletis nigrescentella* and *Tischeria marginata*.

(To be continued.)

BUTTERFLY COLLECTING IN WOOD WALTON, HUNTS, AREA DURING 1944.

By H. A. LEEDS.

The winter was generally breezy and cool, but prolonged frosts were absent and snowfall very slight, only once covering the ground for a few hours during winter, and again in the early morning of 31st March. Between 23rd and 28th March the weather was warm and hibernated *rharni*, *io* and *urticae* were flying. April commenced with frost and fog and was mainly dull, cool and dry, but 25th-27th were hot and sunny. On 6th a few blackthorns were beginning to blossom and the leaves of

high whitethorn trees showing well and contrasting with only slight leafing in the hedges. By the 19th blackthorns were well in flower and on 25th extensively leafed. May commenced with very little whitethorn blossom and provided gales on 4th and 5th, and sharp frosts on 7th, 8th and 15th; on the last date the horse-chestnut trees were in full bloom (compared with 19th April in 1943). The frosts blackened the leaves of ash trees, and in Monks' Wood all the lower branches of oaks were denuded of leaves; testing them in various places with a beating tray no *T. quercus* and only one moth larva was found. For the fourth successive year *pruni* larvae suffered mortality as on 8th May; two out of three were frost-bitten and died quickly. Another severe frost occurred on 24th June, damaging potato tops.

Hot days or periods were limited and sunshine deficient, rainfall was much below average until 19th August when dull and cool weather with excessive rainfall ensued up to the end of October, almost preventing observations except in gardens near home during rare intervals of sunshine. This long and fruitless backend made the butterfly season remarkably short, for it barely commenced in April when of fresh imagines I only saw six, viz., one male *rapae* 15th, one male *cardamines* 22nd, and four on the 30th. The next *rapae*, a male, was seen on 3rd May, also the first *napi*, a female; whilst *brassicae*, a male, on 7th May, was the first noticed. These two pests in both broods were so limited that their larvae did insignificant damage to cabbages; *napi* was fairly plentiful, but *cardamines* below usual quantity. All four species were of very ordinary quality. Appended are dates of other species when first seen, together with some remarks regarding ensuing quantities, etc.; where no number is given only one was seen on that date.

11th May, two *aegeria*, worn; 12th, *argiolus* and two *megea*, all males; 13th, *malvae* and *tages*, both very limited; 22nd, *pamphilus* female, remaining scarce; 24th, *icarus* and two *phlaeas*, all males; 26th, *C. rubi*, worn, and only odd ones later, none had been seen previously on May blossoms; 27th, several *agestis*; 31st, *venata* (*sylvanus*), common.

6th June, *lucina* male, and one other afterwards; 12th, *jurtina* male, plentiful and several more or less bleached; 18th, five *pruni* males, no fresh ones after 20th, only about 30 seen and the four females netted were released; after their first appearance Monks' Wood was extensively toured for a week; 24th, *cydippe* male, *urticae* and male *galathea*: the last species occurred most abundantly locally and several paired when the wings of the female were wet and unexpanded; they were low down in the grass; a most strongly black-patterned female was seen on a black knap-weed flower just before the roadside grass was cut; it disappeared until the hay was carted and then returned and was seen near the same place for some days; it was not taken in the first instance, as the left frontwing was badly rubbed.

5th July, *P. quercus* male, scarce; 6th, few *sylvestris* (*flava*), plentiful; 7th, *lineola*, abundant and spreading; 8th, few *hyperantus*; 11th, *w-album* male and only another later, no larvae of this or *P. quercus* could be found; 12th, *tithonus* male, others emerged until 20th when first two females were seen, after this both sexes were plentiful and to my surprise several were partly bleached and I retained two males and nine females of these "partim transformis" among which 1, 2, 3 and 4 wings were affected with bleached streaks or patches. 15th, five *paphia* males; 18th, one *camilla*, no others seen in Monks' Wood, but four or five were seen

one afternoon by a collector in Upton Wood, which is not far distant from Monks' Wood and on the opposite side of the Great North Road; 20th, *c-album* male, no others seen in this first brood although a few after hibernation were seen in the spring; second broods of three species were observed on this date, viz., five *argiolus*, nine *phlaeas* and a few *agestis*; 24th, *io*, and several next day; 25th, two *rhamni* males, few of both *megea* and *icarus* second broods.

7th August, *croceus* male in my garden but no others could be found in clover fields, and none of the more attractive lucerne was grown near here; 12th, one female and quite thirty males of *betulae*; 26th, *atalanta*.

19th September, *phlaeas* female, the only imago of third brood seen; 26th, *c-album*, a large female of second brood; it was not taken as this species is rapidly diminishing in numbers around this area, an odd one was now and again seen in gardens during October, three of these were differently damaged, whilst three or four others were noticed somewhat widely apart, the flowers of single dahlias were especially attractive and in addition to odd *c-album* and a few *atalanta* many *urticae* visited them.

I have not included *aglaia* in the list as they were much worn when found on 12th July and they, as well as other *Argynnis*, were scarce, but this is explained by the larval food of wild-violets being destroyed by ploughing in fields, and by overgrowth of bushes in woods.

I saw no *cardui*, *semele* or *iris*, but in the latter part of July the keeper in Monks' Wood saw what he described as "a large dark-blue butterfly with some white on it;" probably this was a male *iris*. Apart from deepening the ditches adjoining the two previous clearings of about 30 acres of Monks' Wood, there is no material alteration; chalk has been added to the soil and ploughed in, but the clearing has not been cropped this year.

A fair number of aberrations were obtained and among them the following:—*P. icarus*. Male undersides *alba*; *antialbescens*; *apicojuncta*; *obsoleta*; *anticaeca*; *obsolescens*; female uppersides *anti-post* and *radiosa* these three occurred among four consecutive *icarus* of first brood, which were picked up when settled down one evening; *opposita*; *syngrapha*; *transformis* all wings; *metallica* all wings peppered with lavender-blue scaling; and a fine *postradiosa-signata-major*. *A. agestis*. Male undersides *infra albescens*; *brunnescens*; female underside *antitransiens-major*. *L. phlaeas*. Male uppersides *pallidula*; *ignita*; *antipallidula-partim-auroradiata*; *auroradiata*; female upperside *dexpartimalbodescens*. *S. galathea* female upperside *postobsoleta*, all three of the lower spots being absent. *P. megea* male upperside *antiparvipuncta-obsoleta*, this has only a very tiny submedian spot on frontwings and two spots (one tiny) on hindwings, and in addition the last fulvous division is obliterated by the dark-brown ground. *M. tithonus* female underside with two fair sized additional spots below the submedian on both frontwings, the lower being in the form of a joined twin-spot but connected side by side on the right wing, it is situated above what in some species is a twin-spot division, each spot has a white pupil. *P. malvae* male upperside frontwings very strongly spotted with white. *S. pruni*, a male upperside *progressa* with three fulvous patches on frontwings, such do occasionally occur, but Tutt probably had not seen one as he only included *progressa* for the somewhat common female form, viz., "Forewings with 2 or 3 fulvous patches," this, however, was far excelled by an outstanding and probably unique male upperside, ab. *aurora*, the frontwings

having fulvous extending diffusely from the border to the discoidal spot, and below this three long fulvous patches, two of which ray inwards as far as the branches of the main veins, and the lowest one extends diffusely almost to the base, both hindwings have five fulvous patches and on the left hindwing the third one is well elongated inwardly, unfortunately below this a portion was torn away, but another male caught the same day, 19th June, repaired it and a small portion of the other hindwing, the important frontwings were not torn. It was a very windy day and as the insect was blown downwards towards me I saw the fulvous raying in the sunshine and thought it was a well rayed *ab. aurosa* female, as such do occur rarely, but later at home was agreeably astonished to find that a male could produce such an aberration.

T. betulae male underside *postsinis-partimlutescens* with more than half of the lower part of the band and its extension into the tail orange instead of red. On 11th June twenty-three *betulae* larvae were beaten from blackthorns which were being destroyed, and as usual were fed *in the dark* in metal boxes glass downwards, but always away from sunshine, which heats the tins, one larva died and one pupated dull black instead of brown, and when opened was found to be dry and solid inside, the remainder produced eight males and thirteen females, without any deformity, and among the female uppersides two were *restricta-lineata*, Tutt, one of which just reached his expanse for major "more than 40 mm.," whilst another major measured 42 mm.

Except where Tutt is named, all the aberrational descriptive terms are from the *Monograph of coridon*, Bright and Leeds, and do not come into Nomenclature, and can be used and applied to describe any species of butterfly. Near their haunts I have several times come across *betulae* feeding and flying in fairly considerable numbers, each time it has been during the morning not long after breakfast; their time for collective feeding has been short and thistle flowers were favoured and always the weather has been hot. In 1933 at the end of July and beginning of August for a few mornings in succession several males and females were visiting thistles in a field adjoining the southern face of Monks' Wood, but prior to that year in a portion of wide driveway, between Abbots' Ripton and Alconbury, scores were feeding one August Bank Holiday Monday; in that case no wood was near, but the hedges and driveway contained plenty of blackthorns.

On 12th August 1944, directly after breakfast, I noticed that a large bank of cloud was clearing across the sky and decided to visit a suitable coppice, where thistles and other flowers bordered the sunny side; in about ten minutes the sun shone warmly and about twenty minutes later the flowers were reached, *betulae* had nearly finished their repast and soon all of them were settling on the high whitethorn and young ash in the hedge; curiously, none settled on the interspersed blackthorns. They were very restless and gambolled with each other and also with *tithonus* and about eight worn *T. quercus* which apparently emanated from a solitary oak about fifty yards distant. The sun shone hotly and after about an hour *betulae* gradually flew higher and less frequently, ultimately resting in a background of somewhat high elms. It was difficult to count them, but fully thirty males of *betulae* were seen, but only one female, which endeavoured to settle on a thistle flower and was immediately pursued by a male and not seen again. Most of them were worn but a perfect male upperside, and the male underside *postsinis-partim-*

lutescens were retained. It is possible that *betulae* after a long spell of dull weather might be disposed to feed collectively other than in the morning, but only odd ones have been noticed feeding at any other time and apart from thistles they have been seen on bramble and snowberry flowers. No wild *betulae* had been seen prior to the 12th August, but the next morning two worn males were settled on onion seed heads in my garden. Those which I bred indoors had no artificial heat and 21 emerged in July, one male, 5th; five males, 13th-15th; one female, 15th; two males and four females, 16th-18th; eight females, 19th-28th. This larva will wander from the foodplant, either narrow or broad leaved blackthorn; if sleeved or in a cage, they starve, and in metal boxes many do not obtain full nutrition owing to a lethargic tendency to remain for lengthy periods on the glass if exposed to light; they sometimes rest on the glass, perhaps for moulting, and need not be disturbed as they will readily find fresh food *in the dark*, especially if two or three leaves are allowed to touch the glass, but not pressing on them; if the lid is taken off upside down the frass can be brushed off it daily with a camel-hair or soft brush, such can also be used for transferring the larvae, but, if they hold tight, cut the leaf off, or if on a stem remove any leaf and place it among fresh food; when obtaining the latter it is best to put a reserve in a close fitting tin in case a wet period ensues, this reserve to be renewed and not used if weather is fine. Rearing them *in the dark*, even in shallow tins without glass lids (but not hinged lids) has been always successful even from the earliest stages, and commencement has been made with up to fifteen in a small sized tin not overcrowded with foodplant and transfer made to a suitable larger box. The quantity should be decreased and larger boxes used as they progress. I finish the feeding with not more than four or five in a tin, and when well pupated put a little sticking solution from a tube on the bottom of the tin, steer the pad end of the pupa on it with the brush and allow to dry; then the boxes are kept glass upwards in a drawer; they may emerge at any time during the day and require watching with a net and killing bottles handy; the light when opening the drawer may cause any well-developed to dash about; if so, quickly place the palm of a hand over the glass and open it inside the net for bottling. The drawer should have been closed quickly in case any more had emerged, but of course they should not be killed until well out. If very fresh this species when pricked with a setting needle is apt to bleed from the wings; those which commence dashing about are less troublesome in this respect, and if the upperside in some is scratched such can be set for their handsome underside. After about nine or ten days in pupa I brush them over lightly with water if weather is hot. I have stuck *betulae* pupae on the bottom of a cage and more damage has resulted after emergence than with the use of metal boxes. This larva is naturally camouflaged on the foodplant, and it is best to attach a piece of paper to each box denoting the quantity it contains.

I have never previously seen the second brood of *phlaeas* in such abundance as occurred in Walton Lane this year and in an adjoining bean field. For several years the most prolific place for *phlaeas* was on the west side of the railway embankment towards the fen; visiting this long flat stretch after tea on 26th July when it was warm but dull, I found two fresh male *phlaeas* and examined dozens of *agestis* resting collectively on the lower slopes of the embankment; some female *galathea* were still emerging whilst many fresh *jurtina*, mostly females, were about.

The next day, to my regret, the whole area was destroyed by fire, probably caused by red-hot cinders from an engine. The cuttings escaped any material fires this season and *icarus* locally on them were more plentiful than for several years, but hot days suitable for flight were very limited, and during the intervening cold spells they almost entirely disappeared.

NOCTUAE CAPTURES IN MID-SUSSEX FROM THE YEW HEDGES.

By T. A. DANCY and L. E. SAVAGE.

During the summer of 1942 it was repeatedly noticed that many hundreds of wasps and flies were to be seen flying about the cultivated Yew hedges, and, upon examination, a Scale Insect was found on the small twigs, and a sugary excretion was noticed on the leaves. An idea then came, "Honeydew!" with all its potentialities. At night, a further examination by subdued torchlight gave astounding results. The following list shows captures over the past three seasons. Owing to Double Summer Time, particularly in June and July, it has not been possible to work at the Yews later than midnight, and there is no doubt, that if this had been done, a much larger number of insects would have been taken.

The various text books do not give this method of attraction, and it would be very interesting to learn if any other collectors have discovered this very easy way of collecting Noctuae. Tutt, in his "Practical Hints for the Field Entomologist," Vol. 1, page 80, states that "ripe yew-berries sometimes attract the autumnal moths in large numbers," and other authors have stated the same, but it is being suggested that where moths have been taken from the Yews, the collectors were under a misapprehension as to the actual attraction. The fruit of the Yew in Sussex is ripe from the end of September or October and has a fairly thick skin and does not appear to get into that over-ripe state such as the fruit of the blackberry, therefore it is difficult to see how the proboscis of a moth could imbibe the juice of the fruit. [Most Noctuids have well-developed teeth on the tip of the tongue, so are well able to penetrate into soft fruit.—T.B.-F.] Another factor is that the missel thrush and the song thrush take a very heavy toll of the fruit, and, further, moths have never been observed feeding from it. "Sugar" has been put up and results have been almost negligible, whereas the Yew hedges have been full, and ivy blossom, which is in profusion about 30 yards away, also has proved unfruitful.

Sixty-six Species taken at the Yew Hedge (Noctuae), 1942-1944. Names taken from main edition of South's Moths. Those marked * denote common:—*A. segetum**, *A. corticea*, *A. puta**, *A. exclamationis**, *A. ypsilon**, *A. saucia**, *N. c-nigrum**, *N. festiva** (*primulae*), *N. rubi**, *N. umbrosa**, *N. xanthographa**, *N. plecta**, *N. putris**, *T. comes*, *T. pronuba**, *T. fimbria*(ta), *T. ianthina*, *C. prasina*, *M. oleracea*, *M. genistae*, *M. dentina**, *E. protea**, *A. basilinea**, *A. didyma* (*secalis*), *X. rurea*, *X. lithoxylea*, *X. monoglypha**, *X. hepatica*, *A. lutulenta*, *M. oxyacanthae**, *A. aprilina**, *E. lucipara**, *P. meticulosa**, *H. nictitans**, *H. micacea*, *L. pallens**, *L. impura**, *L. comma*, *L. vitellina* (1),

L. albipuncta (1), *L. lithargyria**, *L. conigera**, *G. trigrammica**, *C. morpheus**, *C. taraxaci**, *C. quadripunctata**, *A. pyramidea**, *O. lunosa**, *A. lota**, *A. macilenta**, *A. circellaris**, *A. helvola*, *A. lychnidis**, *A. litura**, *O. citrigo**, *O. aurago*, *X. lutea**, *X. fulvago**, *O. vaccinii**, *O. ligula*, *E. satellitia**, *L. semibrunnea*, *L. socia*, *G. ornithopus*, *C. exsoleta* (3), *P. gamma**.

COLEOPTERA AT LAMPTON, MIDDLESEX.

By HORACE DONISTHORPE, F.Z.S., F.R.E.S., Etc.

(Continued from page 41.)

NITIDULIDAE.—*Brachypterus gravidus*, Ill., *B. pubescens*, Er., sweeping Yellow Toadflax (*Linaria vulgaris*); *B. urticae*, F., sweeping nettles; *Epuraea aestiva*, L., beating blossoms; *Omosita colon*, L., in vegetable refuse; *Meligethes aeneus*, F., sweeping and beating; *M. memnonius*, Er., and *M. flavipes*, Strm., sweeping *Ballota nigra*.

MONOTOMIDAE.—*Monotoma spinicollis*, Aub., *M. brevicollis*, Aub., *M. picipes*, Hbst., *M. quadricollis*, Aub., *M. rufa*, Redt., and *M. longicollis*, Gyll., all in vegetable refuse.

LATHRIDIIDAE.—*Coninomus nodifer*, West., *Enicmus minutus*, L., *E. transversus*, Ol., *Corticaria denticulata*, Gyll., *Melanophthalma gibbosa*, Hbst., and *M. fuscula*, Hum., all in vegetable refuse.

CRYPTOPHAGIDAE.—*Cryptophagus pilosus*, Gyll., *C. punctipennis*, Bris., *C. dentatus*, Hbst., ab. *major*, Donis., and *C. affinis*, Strm., all in vegetable refuse; *Atomaria fimetarii*, Hbst., sweeping; *A. lewisi*, Reitt., *A. cognata*, Er.,? and *Ephistemus gyrrinoides*, Marsh., all in vegetable refuse.

CUCUJIDAE.—*Cathartus advena*, Walt., in vegetable refuse.

MYCETOPHAGIDAE.—*Typhaea fumata*, L., *Mycetophagus quadripustulatus*, L., both in vegetable refuse.

DERMESTIDAE.—*Megatoma undata*, L., sweeping; *Florilinus misacorum*, L., sweeping umbels.

SCARABAEIDAE.—*Aphodius scybalarius*, F., *A. fimetarius*, L., *A. granarius*, L., all in vegetable refuse; *A. contaminatus*, L., in numbers flying over refuse dumps.

EUCNEMIDAE.—*Throscus elateroides*, Heer., in vegetable refuse.

ELATERIDAE.—*Athous niger*, L., *A. longicollis*, Ol., both sweeping and on the wing; *Limonius minutus*, L., sweeping and beating hawthorn blossoms; *Agriotes sobrinus*, Thies., in vegetable refuse.

TELEPHORIDAE.—*Telephorus lituratus*, Fall., *Rhagonycha fulva*, Scop., *Malachius viridis*, F., *M. marginellus*, Ol., all sweeping.

CERAMBYCIDAE.—*Leptura livida*, F., abundant, sweeping umbels, etc.; *Grammoptera holomelina*, Pool, beating hawthorn blossoms, and sweeping umbels.

LAMIIDAE.—*Tetrops praeusta*, L., beating hawthorn blossoms.

CHRYSOMELIDAE.—*Zeugophora subspinosa*, F., common, beating poplars; *Crioceris asparagi*, L., *Cryptocephalus fulvus*, Goetz., *Longitarsus luridus*, Scop., *L. flavicornis*, Steph., *L. pusillus*, Gyll., all sweeping; *L. pellucidus*, Foud., sweeping *Convolvulus sepium*; *Phyllotreta nodicornis*, Marsh., sweeping Wild Mignonette (*Reseda lutea*); *P. con-*

sobrina, Curt., abundant sweeping *Lepidium* and Horse Radish; *P. punctulata*, Marsh., sweeping *Lepidium* and *Sisymbrium*, scarce; *P. hintoni*, Donis., *P. atra*, Pk., both sweeping *Sisymbrium*; *Phyllotreta vittula*, Redt., *P. undulata*, Kuts., *Aphthona aeneomicans*, Allard, *Sphaeroderma testacea*, F., *S. cardui*, Gyll., all sweeping; *Podagrica fuscicornis*, L., sweeping common Mallows (*Malva sylvestris*); *Crepidoclera ferruginea*, Scop., *Chaetocnema hortensis*, Fourc., *Plectroscelis concinna*, Marsh., *Psylliodes chrysocephala*, L., all sweeping; *Cassida vibex*, L., *C. viridis*, L., sweeping thistles.

TENEBRIONIDAE.—*Alphithopagus bifasciatus*, Say., *Alphitobius piceus*, Ol., in vegetable refuse.

PYTHIDAE.—*Lissodema 4-pustulata*, Marsh., sweeping.

COLLECTING NOTES.

PHRYXUS LIVORNICA AT SWANAGE, DORSET.—A ♀ specimen of *P. livornica* was brought to me to identify to-day. It was in excellent condition, and was netted while hovering over the blossom of aubretia in a garden. Another specimen was seen at the same time. Does this portend a *livornica* year? The last good year here for this species was 1930 when over a dozen were captured.—LEONARD TATCHELL, Swanage, 17th April 1945.

DIOSPILUS EPHIPPIMUM, NEES (HYM. BRACONIDAE), A SPECIES NEW TO BRITAIN.—In 1942 (*Ent. Record*, 54, 105 (1942)) I recorded that Dr H. E. Hinton had bred *Dorcatoma dresdensis*, Hbst., out of the "Tinder Bracket" fungus, *Fomes pomaceus*, from an apple tree at Linton, Cambridgeshire, in May and June 1942. In 1943 Dr Hinton kindly gave me some of the fungus from an apple tree from the same locality. I also bred *Dorcatoma dresdensis* from it. In 1944, when turning out the jar which contained the fungus, I found several specimens of a Braconid, which were unfortunately dead and not in the best condition. Mr Nixon tells me the insects are a species of *Diospilus*, and that the two specimens I had set were both males. I find that Morley recorded in 1907 (*Trans. Ent. Soc. Lond.*, 1907, pt. 1, p. 22) that Nees had bred *Diospilus ephippium*, Nees, from larvae of *Dorcatoma dresdensis* in "boleti." This record is also quoted by Kirchner and by Marshall in his *Braconidae of Europe*. As it seems most probable that the Braconids in question are *Diospilus ephippium* (the thorax is partly red), and as Nixon also thinks the same, I feel justified in bringing it forward as a British species.—HORACE DONISTHORPE, British Museum (Nat. Hist.), Entomological Department, 20.iii.45.

OCCURRENCE OF ACRYDIUM SUBULATUM IN BEDFORDSHIRE.—Since the publication of my note on this species (ante, p. 106, 1944) I caught one or two specimens, including males, later in the season from widely separated localities in the south of the country:—

Leighton Buzzard (sandpit, filled with water), 24/8/44.

Bramingham, near Luton (pond on boulder-clay), 28/7/44.

Totternhoe (marshy grassland on gault), 29/7/44.

(For further information and a complete list of species, see B. Verdcourt, *E.M.M.*, 81, 8).—B. R. LAURENCE, 31 Sherwood Road, Luton, Beds, 12/3/45.

- verna*, Esp. (1788-7), *Abbild. Noct.*, IV (1), 272, plt. 117, 5-6. Syn.
ab. saucia, Esp., *l.c.*, (2), 505, plt. 182, 5.
chenopodii, Esp., *l.c.*, plt. 181, 2-3. Syn.
treitschkei, Bdv. (1827), *Ann. Sci. Linn. Paris*, p. 111, plt. 6, f. 2=
pugnax, n.sp.
treitschkei, Hb.-Gey. (1834-5), *Samml. Noct.*, 850. Syn.
oregonica, Grote. (1881), *Can. Ent.*, XIII, 230. (America Sp. or Syn.)
f. farkasii, Tr. (1835), *Schmett*, X (2), 74.
ab. albifusa, Walk. (1857), *Cat.*, XII, 757. Amer.?
glaucovaria, Walk. (1860), *Can. Nat. and Geol.*, V, 255. (Am. Sp.)
canescens, Moore (1878), *A.M.N.H.*, V (1), 233. f. of *brassicae*.
ab. indistincta, Tutt (1892), *Br. Noct.*, III, 82.
ab. turatii, Culot (1909), *N. et G.*, I (1), 105, plt. 17, f. 17: plt. 18, f. 4.
r. cinnamomeana, Roths. (1913), *Nov. Zool.*, XX, 121 [*Drdt.-Stz.*, *l.c.*].
ab. brunnescens, Heyd. (1933), *Int. Ent. Zeit.*, XXVII, 330.
r. zermattensis, Drdt.-Stz. (1934), *Pal. Noct. Supp.*, III, 96.
ab. fruticosa, Dumont (1934) [*Drdt.-Stz.*, *Pal. Noct. Supp.*, III, 97.]
Doubtful.
ab. lodbjargensis, Hoffm. & Knud. (1937), *Flora and Fauna*, 59 [*Drdt.-Stz.* (1937), *Pal. Noct. Supp.*, III, 252].

Tutt dealt with the typical form: (1) *trifolii*, he discussed the typical form at some length; (2) var. *saucia*, a pale ochreous form; (3) var. *indistincta*, unicolorous dark grey with obsolete markings; (4) *ab. farkasii*, ground dark brown-ochreous and darkening of ground colour; (5) *ab. albifusa*, an American form; (6) *oregonica*, another American form.

(a) subsp. *farkasii*, Tr., *Schm.*, X (2), 74 (1835).

ORIG. DESCRIP.—“This is the Algerian good subspecies, while in Europe it is an aberration” (Roth, *Nov. Zool.*, XXI, 321 (1914)).

(b) *r. farkasii*, Tr., *Drdt.-Stz.*, *Pal. Noct. Supp.*, III, 96, plt. 14a (1934).

DESCRIP.—“Paler subterminal area, light colour cuneiform between orbicular and claviform. *Syrmia*, *Irkutsk*, *Ussuri*.”

ab. turatii, Culot, *Noct. et G.*, I (1), 105 (1909).

FIG.—*l.c.*, plt. 18, fig. 4.

ORIG. DESCRIP.—“Absence of the median line on the underside of all the wings. The肘ed line and the extrabasal line often very close together. No trace of the claviform.” *Saxony*.

f. brunnescens, Heydm., *Int. Ent. Zt.*, XXVII, 330 (1933).

ORIG. DESCRIP.—“In addition to the pale grey-yellowish typical form there is found here a somewhat different form, which inclines to a darkening of the forewings which is caused by the cloudy thicker infusion of grey and grey-brown scales, particularly in the marginal area before the waved line and in the middle of the wing. Particularly extreme are two ♂♂ from Amrun, which with their strong grey-brown forewings and sharp yellow-white with which the waved line is suffused show quite like the Latin W. of a *dissimilis*. Before this clear brown marginal area, out beyond to the margin is powdered with very dark slate-grey, like the lower half of the reniform stigma. Orbicular pale margined. The costa dotted with white-yellow. This dark costal form

is doubtfully another dark type of aberrational form to which Warnecke refers in the "Grossschmetterlinge of the environs of Hamburg-Altona." Schleswig-Holstein.

(a) ssp. *cinnamoneana*, Roths, *Nov. Zool.*, XX, 121 (1913).

ORIG. DESCRIP.—"The Mauritanian examples are all more rosy-cinnamon, less grey, in tint than European ones." Mauritania.

(b) ssp. *cinnamomeana*, Roths, *Nov. Zool.*, XX, 121 (1913) [Drdt.-Stz., *Pal. Noct. Supp.*, III, 97 (1934)].

DESCRIP.—"All specimens from Algeria incline to cinnamon-rose and are less grey than European specimens. Generally, however, they are also very variable in size as well as in the distinctness of the markings. The larvae feed on *Peganum harmala*, burying themselves in the sand by day." Cyrenaica and Sardinia as well.

ab. *fruticosus*, Drdt.-Seitz, *Pal. Noct. Supp.*, III, 97 (1934).

ORIG. DESCRIP.—All specimens from Algeria incline to cinnamon-rose, less grey than European specimens." Cyrenaica, Sardinia. (Doubtful sp?)

(b) ab. *fruticosa*, Dumont [*Pal. Noct. Supp.*, Drdt.-Stz., III, 97 (1934)].

ORIG. DESCRIP.—"One specimen. Smaller; coloration more inclined to ochreous rose. Lines are more delicate and a purer brown-black with wide brown marginal band. Tunisia." [Doubtful.]

(a) f. *zermattensis*, Drdt.-Stz., *Pal. Noct. Supp.*, III, 96 (1934).

ORIG. DESCRIP.—"A somewhat more elongate build, more oblique outer margin, a softer grey ground colour, smoother scaling, and not so irregularly coarse-grained. Transverse lines almost obsolescent." Compared with specimens from Central Germany, *l.c.*

(b) r. *zermattensis*, Drdt.-Stz., *Pal. Noct. Supp.*, III, 96 (1934).

ORIG. DESCRIP.—"More elongate, more oblique outer margin, softer grey ground, smooth scaling." Algerian race.

ab. *lodbjergensis*, Hoffm. & Knudsen, *Flora and Fauna*, 59 (1935) [Draudt-Stz., *Pal. Noct. Supp.*, III, 252 (1937)].

DESCRIP.—[A very peculiar dark grey-black form in which the pale yellow-brown fasciae contrast strongly."] West coast of Jutland.

DESCRIPTION of figure 19 on plt. in *Flora and Fauna* (Denmark) (1935) —"A very dark blackish form, with markings of light brown on forewings. Sub-terminal and waved lines, chequered fringes, surround of black reniform, surround of orbicular and other usual markings towards base, all of them fairly conspicuous dull red-brown. Reniform nearly full black and from this a narrow band of the same black to the inner margin, lining the waved line on the inner side. Rosel, *Ins. Belust.*, I, plt. 48, f. 6 (1746+), is the only figure with which it has any resemblance. Werneb. agreed that this latter was *chenopodii*, but the latter has the markings poorly depicted and placed."

Hadena, Ochs. & Tr. (1816-25), Dup., Tutt, Barr., Meyr. [*Polia*, Ochs. & Tr. (1816-25), H.-S.: *Trachea*, Ochs. & Tr. (1816-25), H.-S., Stdgr., Hamp., Splr., Sth., Warr.-Stz., Culot, Drdt.-Stz.] *atriplicis*, L. (1758).

Tutt, *Brit. Noct.*, III, 86 (1892): Meyr., *Handb.*, 128 (1895): Barr., *Lep. Br. I.*, V, 43, plt. 189, f. 3 (1899): Stdgr., *Cat.*, IIIed., 184 (1901): Splr., *Schm. Eur.*, I, 210, plt. 51, 2 (1906): South, *M.B.I.*, I, 264, plt. 126, 5 (1907): Hamps., *Lep. Phal.*, VII, 150, f. 29 (1908); Warr.-Stz., *Pal. Noct.*, III, 187, plt. 43g (1911): Culot, *N. et G.*, I (1), 201, plt. 36, 17 (1913): Meyr., *Rev. Handb.*, 81 (1928): Drdt.-Stz., *Pal. Noct. Supp.*, III, 169 (1934).

Rösel, *Belustig.*, I (2), 177, plt. 31 (1746+), gave a good figure which served early writers as a figure of the species they had described.

Schiff., *Verz.*, p. 82, *Noct. O.* 10 (1775). The Melden Eule (an *Atriplex* sp.).

Esp., *Abbild. Noct.*, IV, 605, plt. 168, 1-3 (1790+), gave a recognizable figure of *atriplicis*.

Ernst & Engram., *Pap. d'Eur.*, VII, 81, f. 464c, d, e, f (1790), gave four good figures of this insect, but only said that it is attached to sp. of *Atriplex*.

Donovan, *Nat. Hist. of Brit. Ins.*, VIII, plt. 262 (1800), gave an excellent figure with larva and foodplant.

Hb., *Samll. Noct.*, 85 (1802), is a very good figure but should be brighter and fresher.

Illig., *Neu. Ausg. Verz. Wien*, I, 273 (1801), identified this as the *atriplicis*, L., and of other authors.

Dup., *Hist. Nat. Lep. Fr.*, VI, 432, plt. 100, 1 (1826), gave a very good figure of a form marked with an unusually light green verging on whitish-green. The genus *Hadena* (1846 *Cat.*).

Dup., *l.c.*, p. 435, noted of the curious errors made by Geoffroy in his "Hist. of Insects," II, 159, in confusing this species with *chrysitis*. "This is the opportunity to remark on the confusion, which exists in Geoffroy, as to this species. In calling it *Volant doré* it is clear that his intention was to deal with *N. chrysitis*, because of the phrase from Linné, which he cited in reference to this Noctua. But, on the other hand, the description, which he gave of it, agreed only with *N. atriplicis*, and the figure of Rösel to which he referred represented quite truly the latter. Then he described one species in giving it the name which he had reserved for another."

Steph., *Ill.*, III, 22 (1829), gave a good description of this then rare species under the genus name *Trachea*, Ochs. & Tr., and Wood, *Index*, p. 57, plt. 13, f. 289, gave a good figure of a British example.

H.-S., *Sys. Bearb.*, II, 263 (1850), said that the insect was often fresher than that depicted by Hb. 83. He used the genus *Polia*, but in his copy of Gn. (which I have) he put *Trachea* as a note in pencil.

Barrett, *l.c.*, plt. 189, gave two figures showing the delicate green coloration, which fades almost at once when the insect is killed.

Stdgr., *Cat.*, IIIed., 184 (1901), gave *gnoma*, Btlr., and his own *similis*, which was described and figured in *Rom. M.*, VI, 456, plt. 9, 1 (1892), "al. ant. olivaceo-inspersis, ochraceo-maculatis."

Splr., *Schmett. Eur.*, I, 210, plt. 41, 2 (1906), included abs. *similis*, *gnoma* and *diffusa*, and figured a typical dark green form.

South, *Moths Brit. Is.*, I, 246, plt. 126, 5, gave a figure on which the green had become shades of brown and yellow, otherwise it was very good.

Warr.-Stz., *Pal. Noct.*, III, 187, plt. 43g (1911), gave figures of *atriplicis*, typical, and of *gnoma*, Btlr. They included abs. *similis* and *suffusa*. Said that *gnoma* (from Japan) was larger, deeper purple, green shading less developed, the white blotch larger and more conspicuous.

Hamp., *Lep. Phal. Noct.*, VII, p. 150, fig. 29 (1908), gave a good b. and w. figure. Included two abs., *similis*, Stdgr., and the form without any green markings, which Strand in 1915 named *deviridella*. He treated *gnoma*, Btlr., as a Syn.

Culot, *N. et G.*, I (1), 201, plt. 36, f. 17 (1913), gave only ab. *similis*. He gave a good figure of a typical form.

Draudt-Stz., *Pal. Noct. Supp.*, III, 169 (1934), pointed out that the complete absence of green colour, which Hampson had noted in 1908, but did not name, was subsequently named by Alph. *inornata* in 1908 and that *deviridata*, Klem. (1908), and *deviridella*, Strand (1915) were probably both synonyms. They also pointed out that the absence of the usually prominent white blotch on the forewings was first named *immaculata*, by Slevogt. [No references to this are obtainable at the present time] and that the *enarismene*, Slats. (1910) is probably a synonym of it, although no mention is made of the stigmata being absent as in *immaculata*. They also include the Belgian specimen, which on emergence had yellow coloration in place of green, *epixanthana*, Mazger.

Of the Variation Barrett said:—

Not very variable, though there is some diversity in the extent of the green blotches and the pale margins of the reniform stigma, but unfortunately the brighter colours fade; the green becomes yellow, the purple shades less distinct, and the central blotch yellower, so that the most perfectly coloured specimen becomes in a few years of quite different appearance.

The Names and Forms to be considered:—

atriplicis, L. (1758), *Sys. Nat.*, Xed., 517.

race *gnoma*, Btlr. (1878), *A.M.N.H.*, (5)i, 195. (A sp.)?

race *similis*, Stdgr. (1892), *Mem. Rom.*, VI, 456, plt. ix, 1.

ab. *immaculata*, Slevogt. (

ab. *diffusa*, Splr. (1905), *Schm. Eur.*, I, 210.

ab. *inornata*, Alph. (1908), *Hor. Ross.*, XXXVIII, 593 [actually named Hamp.'s note VII, 130].

ab. *enarismene*, Slats. (1910), *Hor. Ross.*, XL, I, p. 79 [Syn. ? of *immaculata*].

ab. *deviridata*, Klem. (1912), *Spraw. Kom. Krak.*, XLVI, 11. Syn.

ab. *deviridella*, Strnd. (1915), *Arch. Naturg.*, 5, LXXXI, A, 11, 182. Syn.

ab. *epixanthana*, Mazger (1928), *Lamb.*, XXVIII, 59.

ab. *olbreusei*, D. Luc. (1932), *Bull. S. ent. Fr.*, XXXVII, 169. Syn.?

Tutt dealt only with the typical form insufficiently described by Linné in the *Sys. Nat.* He also discussed the better description in the *Fn. Succica*.

The variation in this species is small, but seems to have been named in a very confusing manner.

race *gnoma*, Btlr., *A.M.N.H.*, (5)i, 195 (1878).

ORIG. DESCRIP.—“Close to *atriplicis*, but much larger and darker, the primaries of a slaty-grey colour, varied with black and brown, with

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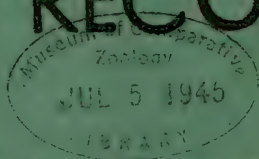
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JUNE 1945

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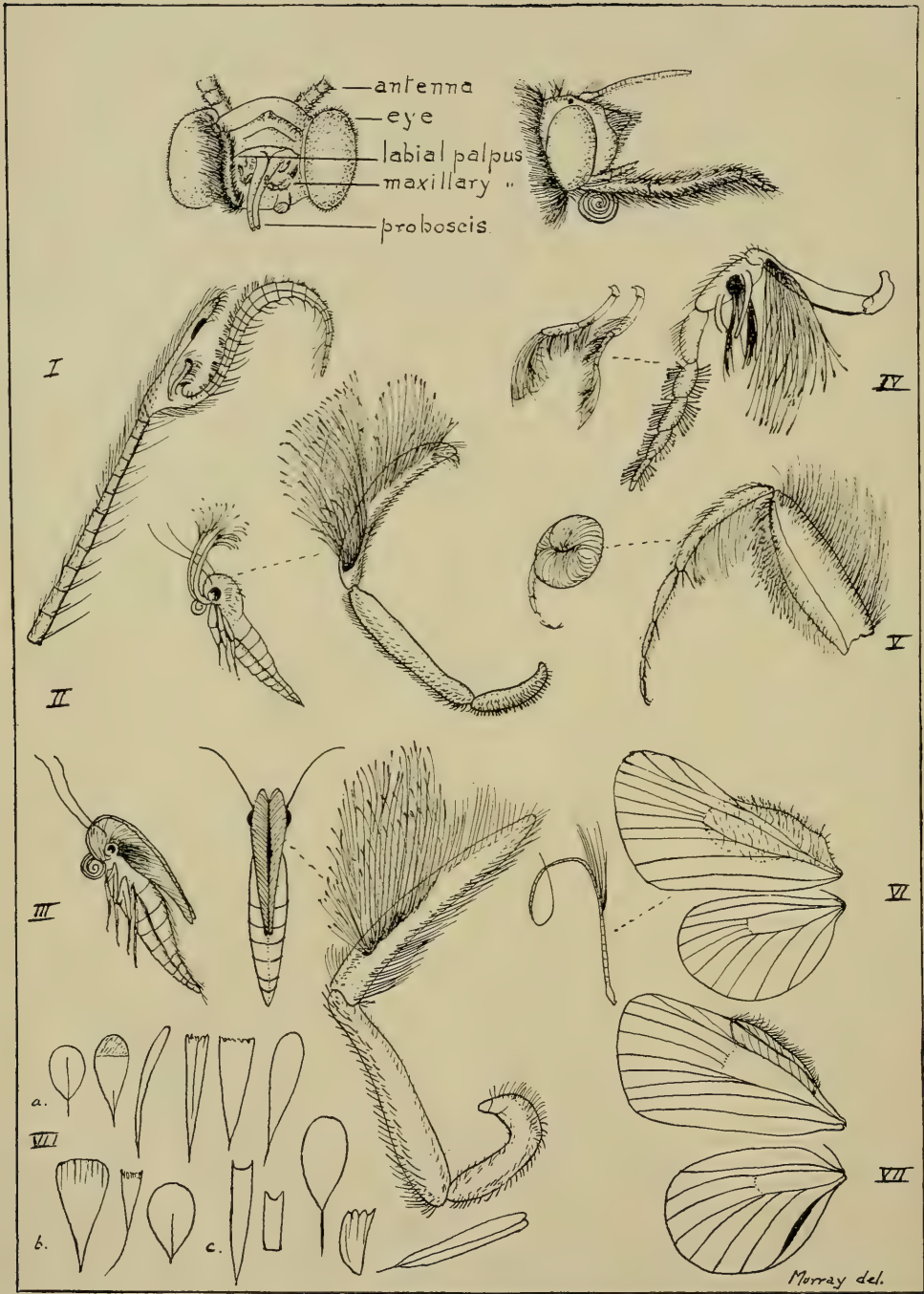
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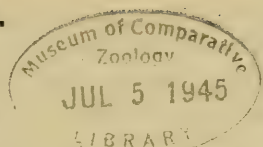


SOME SENSE-ORGANS OF MOTHS (AGROTIDS).

THE SENSES OF MOTHS.

By REV. DESMOND MURRAY.

(Plate II.)



13820

Although some knowledge has been gained in recent years of what may be called the senses of insects, the information is far from complete. Many of our common moths are found to have organs about which very little is known; admittedly they are difficult subjects to study in life and although they can be dissected it is seldom that this tells us how the various organs function or what is their particular use.

What is the function, for instance, of the dorsal folded lobe found in the hindwings (giving the appearance of having six wings) of the males of *L. halterata* and *L. sexualis* (*Seraphin*) or the extraordinarily long tuft of scales at the extremity of the body of the male *S. vetulata* (*Brown Scollop*)? Other examples of secondary sexual character have already been touched upon in some recent papers:—(*Ent. Record*, Vol. liii, p. 73; Vol. liv, p. 65; Vol. lv, p. 15; Vol. lvi, p. 109). Reference to some of the literature has also been given in these papers. The thorax and abdomen often have various forms of scent organs, but the legs, palpi, antennae and wings also sometimes hold scent brushes, which take a great variety of form. One becomes more convinced that to get anything like a full knowledge of these elaborate organs one cannot confine oneself to examples from any particular country or area; comparison must be made with examples from other countries. This fact applies to Lepidoptera in general and even more truly to Entomology as a whole. Most of the families of Lepidoptera occur throughout the world. The larger the number of examples studied the greater will be the knowledge gained. From the elaborate construction of certain sense organs, found more generally in tropical species, it is possible to interpret the simpler forms, though of similar structure, found amongst our own species. Hence the value of such a comparative study.

It is with the object of seeking out the use and function of these complex and often minute parts, not with a view to seeking the sensational or pretending that one knows much about them, that a few forms are given here of what may be considered as exaggerated examples.

Very few collectors from these countries have worked in S. America in recent years, where insect life is so abundant and varied and the immense fauna so imperfectly known. (See *l.c.*, Vol. lvi, p. 80.)

It may be of interest to mention two, now deceased, who collected there within the last forty years. A few particulars only are now known about these two gentlemen, for which I am indebted to the late Mr L. B. Prout.

Mr W. Foster collected at Sapucay in Paraguay during the years 1902-04. Much of his abundant material was sold in London some years later, the greater part being bought by the British Museum and by Lord Rothschild of Tring.

Mr F. Birch collected at Tomas Ottoni in N.E. Brazil in 1907-12, where he was stationed during those years. Much of his fine material also found its way to these two museums. There was, however, a certain amount from both collections which came into the hands of others.

It is from some of this material that the present examples have been taken to illustrate the subject matter of this paper.

The exact naming of the insects could not be given by the authorities of the British Museum as even now very little is known of the S. American species; nor is this essential, since the subject is not the description of particular species, but the possession by certain moths of extraordinary sense characters. The family or genus is, however, given in each case with a short description of the insect concerned.

Antennae:—The antennae are often elaborately formed, especially in the male, and must be considered to be the principal sense organ; they are also of great value in classification. The example shown has a cleft near the apex and holds a brush or setae, similar to those found on scent organs. A distinct brush springs from the divided part. The writer is not aware of any other example where such an organ occurs on the antennae. (No. VI shows a small pencil of hairs.)

Fig. I—*Agrotidae* sp. Exp. 20 mm. Paraguay.

Fore and hindwing a uniform warm brown, marked with lighter spots. The genitalia are not symmetrical, a figure of which was given in *Ent. Record*, Vol. lvi, Plate III, Fig. IV.

Palpi:—The labial palpi are generally three-jointed organs arising from the labium, projecting outside the maxillary palpi. They vary considerably in size and form and with some genera are useful in classification.

According to Meyrick they are organs of touch (perhaps also of scent) but no explanation of their variety of form has been suggested nor is their use really understood.

The two examples given here, besides being very large in comparison with the size of the moth, also hold a scent brush, springing in each case from the third joint, and contain specialized scales. How these particular organs function can only be conjectured.

Fig. II—*Agrotidae* sp. Exp. 30 mm. Paraguay.

Pale brown, costa of both wings greyish.

Fig. III—*Agrotidae* sp. Exp. 42 mm. Paraguay.

Dark brown, costa of forewings lighter brown.

Legs:—As shown previously in the papers mentioned above, both the fore and hindlegs sometimes hold scent brushes, less frequently the middle pair of legs as well, of which this is an example.

Fig. IV—*Geometridae* sp. Exp. 30 mm. Paraguay.

Dull greyish, shot with purple; three transverse lines across the wings, the outer one waved.

Fig. V—*Lale exhausta*, Guen. Exp. 45 mm. Paraguay and Brazil.

Forewing greyish white, costa with three light brown patches at equal distance apart, between thorax and apex. Hindwing greyish white, median line light brown and some spots. The forelegs with a very large brush of long setae, forming a scent brush. The genitalia are asymmetrical, a figure of which was shown in the former paper—Fig. VI.

Wings:—The wings perhaps more often than other parts occasionally hold organs of sense. The costal fold in the Hesperids and the scent patch in the *Theclae* and other Lycaenids are well-known instances. Many moths have similar organs on the wings. In the two examples given they are found on the costa of the forewing.

Fig. VI—*Agrotidae* sp. Exp. 35 mm. Paraguay.

Mottled brown in both wings with a few whitish spots on angle. Nearly half the area of the forewing is raised with a kind of felted patch, with a prominent fold on the costa. The wing is also angulated where it meets the thorax. The foreleg holds a brush of scales; the antennae divided about middle (as shown) by a fine brush of hairs; the palpi large and prominent. Altogether this is a very specialized insect. Another similar species from Brazil is smaller and darker.

Fig. VII—*Chrysauge* sp. (Pyralid). Exp. 36 mm. Paraguay.

Dark yellow on both wings, without markings, having a silky appearance. The male has a pocket on the costa of the forewing containing a brush of longish setae; the hindwing has a concealed fold in the angle of the wing, holding dark brown scent scales.

Fig. VIII—Different forms of scent scales from Nos. I, II and IV described above.

EXPLANATION OF PLATE: S. AMERICAN AGROTIDS.

Head showing position of different organs. (After Janse.)

I. *Antennae*:—With scent brush in cleft (*Agrotid* sp.).

II and III. *Palpi*:—Side view of body; palpi enlarged (*Agrotid* sp.).

IV. *Leg*:—Middle leg showing scent brush (*Geometrid*).

V. *Leg*:—Foreleg, holding scent brush; *Lale exhausta*, Guen.

VI. *Wing*:—Forewing with scent pocket, antenna of same (*Agrotid* sp.).

VII. *Wing*:—Forewing with scent pocket, hindwing with costal fold (*Pyralid* sp.).

VIII. Various forms of scent scales taken from Nos. I, II and IV.

IRISH LEPIDOPTERA COLLECTING IN 1944.

By BRYAN P. BEIRNE, Ph.D., M.R.I.A., F.R.E.S.

On 17th July I cycled down to Abbeyleix, Co. Leix (Queen's Co.), a virtually unworked part of Ireland, from which few Macrolepidoptera and no Microlepidoptera have been recorded. The following species were taken that evening in the fields and woods just inside the main entrance to Abbeyleix Demesne: **Lomaspilis marginata*, **Cacoecia oporana*, **Argyrotoxa conwayana*, **Ancylis badiana*, **Endothenia oblongana*, **Argyroproctoe rivulana*, **A. lacunana*, **Eucosma cana*, **Mompha locupletella*, **Acompsia cinerella*, **Elachista atricomella*, **E. albifrontella*, **E. luti-comella*, **E. consortella*, **Eupista caespititiella*, **E. glaucicolella*, **Caloptilia sulphurella*, **Ypsolophus costella* and **Lyonetia clercella*.

The following day I went on to Tipperary and on 19th July paid a visit to "Greenfields," an estate about seven miles north of Tipperary town, where Capt. Bagwell Purefoy successfully established a colony of *Chrysophanus dispar* in 1913 and 1914, 400 adults being released in the latter year. The colony held its own for some time and was apparently still in existence in 1928, but the locality has not been visited since (*Proc. ent. Soc. Lond.*, 1929: 53; *Ent. Rec.*, xxxiii: 178). The exact spot is known as the "Hairy Bog" and was found without difficulty, but there was no sign of *C. dispar*. The bog was much overgrown with dense vegetation and the Great Water Dock, which had been planted as food, had practically disappeared. Only one or two plants could be found and these showed no trace of larval attack. While it is possible that *dispar* was not yet out at the time I was there, I think it almost certain that it has become extinct. *Gonepteryx rhamni* and *G. cleopatra* were established in the same locality by Capt. Purefoy but it was too early for specimens when I was there. However, Mr D. A. Quirke, of the Department of Forestry, kindly visited the locality in September and sent me some *rhamni*, so that the species evidently still survives there. This is unfortunate, as the establishment of the species in Greenfields invalidates any records of its natural occurrence in Tipperary. However, female Irish *G. rhamni* differ somewhat from English specimens, so that it may be possible to distinguish the established from the native specimens. No females were taken by Mr Quirke. The history of this species is rather curious. In a note in the *Entomologist* for 1896, p. 363, E. B. Purefoy states that in 1890 and 1894 he planted about a thousand Buckthorn at Greenfields, of which about 800 survived. About 250 *G. rhamni*, imported from England, were released in the latter year. In 1901 further Buckthorns were planted and about a hundred *G. cleopatra* were liberated, but apparently did not establish themselves (*Entom.*, L: 3-5). In justification of the establishment of *G. rhamni* Purefoy (*loc. cit.*) makes the extraordinary statement that "it does not occur in Ireland, neither do either kinds of Buckthorn." This was in spite of the fact that both the butterfly and its foodplant had been reliably recorded at the time from various localities by such collectors as W. F. de V. Kane and E. Birchall, and both known to be widely spread throughout the south and west of Ireland (e.g., Kane, *Entom.*, XXX: 16; Hart, *Ibid.*: 17).

A number of interesting species were taken at Greenfields. Heads of Reedmace containing pupae of **Limnoecia phragmitella* were collected and the moths commenced to emerge that evening. This is the second Irish record for the species; it had been recorded previously from Wicklow. **Phthorimaea fraternella* and **Eupista apicella* were found in the marsh, the third Irish record for each. Lepidoptera as a whole were quite common, in spite of the wind and frequent showers. *Aphantopus hyperantus* was in swarms, together with *P. napi*, *A. paphia*, *M. jurtina*, *P. aegeria*, *H. phlaeas* and *P. icarus*. Other Macrolepidoptera included *Plusia bractea*, *Rivula sericealis*, *Hypena proboscidalis*, *Zanclognatha grisealis*, *Scopula immutata*, *Sterrhia biselata*, *Xanthorhoe designata* and *Chiasmia clathrata*. The Microlepidoptera included *Crambus pratellus*, *C. culmellus*, **Cataclysta lemnata*, *Evergestis straminealis*, *Phlyctaenia lutealis*, *Cnephasia virgaureana*, *Argyrotoxa conwayana*, **Argyroproctoe lacunana*, *Eucosma penkleri*, **Mompha locupletella*, *Schreckensteinia festaliella*, *Glyphipterix thrasonella*, *Argyresthia geodartella*,

**A. nitidella*, *Ypsolophus nemorella*, **Lyonetia clerckella*, **Micropterix aruncella* and **M. calthella*.

The same evening I did some collecting on the north side of Slievenamuck, one of a low range of hills about a mile south of Tipperary town. The weather had turned colder and the wind still kept up. Species taken included *Sterrhia biselata*, *Lygris populata*, *Eupithecia centaureata*, *Cabera pusaria*, **Spilonota ocellana*, *Acroclita naevana*, *Blastodacna atra*, *Argyresthia nitidella*, **Eupista glaucicolella*, **Lithocolletis quercifoliella* and **Nemophora minimella*.

The following day I went up the north side of the Glen of Aherlow, following the stream up to Lough Muskery, a small lake at an altitude of over 1500 feet in the Galtee Mountains. The day started off fine but later the clouds came down and it rained heavily. *P. napi* was common high up near L. Muskery, the specimens being much darker along the veins, and rather smaller, than those from Greenfields. *Maniola jurtina*, *Aphantopus hyperantus*, *Coenonympha pamphilus*, *Calostygia pectinaria* and *Lygris populata* were frequent. The Microlepidoptera included *Crambus pascuellus*, *C. pratellus*, **C. culmellus*, *Euxanthus angustana*, *Tortrix viburniana*, *Eucosma pflugiana*, *Bactra lanceolana*, **Bryotropha terrella*, *Glyphipterix thrasonella* and *Ypsolophus radiatella*.

The following day I returned to Abbeylisc, against a strong head wind, and that evening did some collecting in the wood and along the margin of the bog on the east side of the Abbeylisc-Durrow road. Here **Lithocolletis viminella* was taken, the first Irish record. Several large Geometers were seen flying among the conifers, but unfortunately I only troubled to take one. It subsequently turned out to be **Deileptenia ribeata*. This is the third Irish record; Dr Lisney and I took it in Wicklow and in Kerry in 1939. The following species, not taken in Abbeylisc earlier in the week, were captured: **Ortholitha chenopodiata*, **Hydriomena furcata*, **Cabera pusaria*, **Hepialus hecta*, **Phlyctaenia lutealis*, **P. prunalis*, **Limnœcia phragmitella*—the third Irish record, **Eucosma penkleriana*, **Bryotropha desertella*, **Batrachedra praeangusta*, **Argyresthia brockeella*, **A. goedartella*, **A. nitidella*, **Eupista fuscadinella*, **Lithocolletis quercifoliella* and **L. ulmifoliella*.

The following day was dull and windless and resulted in the best collecting of the season, nearly seventy species being taken. The area worked was the part of Abbeylisc Demesne on the west bank of the River Suir, opposite the house. Here there are extensive woods, mainly of oak, with numerous marshy glades with scattered oaks. **Telphusa umbripherella* and **Lithocolletis spinicolella* were taken, both species not recorded from Ireland since 1855 when Hogan took the former in Kerry and the latter in Dublin. **Aristotelia tenebrella*, **Phthorimaea fraternella*, **Argyresthia glaucinella*, **Eupista tamesis* and **E. galactaula* also occurred, the third Irish record for each. The only Macrolepidoptera noted were **Maniola jurtina*, **Coenonympha pamphilus*, **Cerapteryx graminis*, **Sterrhia biselata*, **Scopula immutata*, **Dysstroma citrata*, **Epirrhoë alternata*, **Xanthorhoë designata* and **X. ferrugata*. Microlepidoptera additional to the above lists from Abbeylisc included **Pyrausta purpuralis*, **Phycita spissicella*, **Cacoecia xylosteana*, **Pandemis heparana*, **Tortrix löeflingiana*, **T. viridana*, **T. osseana*, **Cnephasia virgaureana*, **C. octomaculana*, **Gypsonoma sociana*, **Argyroproctus nubiferana*, **A. pruniana*, **A. profundana*, **Bactra lanceolana*,

**Paltodora cytisella*, **Telphusa humeralis*, **Bryotropha terrella*, **Gelechia sororcullella*, **Acompsia cinerella*, **Blastodacna atra*, **Carcina quercana*, **Glyphipterix thrasoniella*, **Argyresthia albistria*, **Zelleria hepariella*, **Swammerdamia lutarea*, **Eupista lutipennella*, **E. glaucicollella*, **Lithocolletis cramerella*, **L. lautella*, **Caloptilia sulphurella* abs. *aurantiella* and *mediostriella*, **Ypsolophus radiatella*, **Ochsenheimeria birdella* (*bisontella*) and **Nemophora minimella*. The following day I returned to Dublin.

COLEOPTERA AT LAMPTON, MIDDLESEX.

By HORACE DONISTHORPE, F.Z.S., F.R.E.S., Etc.

(Continued from page 60.)

OEDEMERIDAE.—*Oedemera lurida*, Marsh., abundant sweeping.

MORDELLIDAE.—*Mordellistena pumila*, Gyll., sweeping; *Anaspis frontalis*, L., *A. rufilabris*, Gyll., *A. ruficollis*, F., *A. maculata*, Fourc., all beating hawthorn blossoms and sweeping umbels.

ANTHICIDAE.—*Anthicus floralis*, L., *A. quisquilius*, Th., *A. antherinus*, L., all in vegetable refuse; *A. tobias*, Mars., in refuse "dump," vegetable refuse, by sweeping, etc.

CURCULIONIDAE.—*Rhynchites minutus*, Hbst., sweeping; *Apion malvae*, F., sweeping mallows; *A. miniatum*, Germ., sweeping docks, etc.; *A. haematodes*, Kirby, sweeping; *A. rufirostre*, F., sweeping mallows; *A. difforme*, Germ., *A. trifolii*, L., both sweeping; *A. hookeri*, Kirby, sweeping *Motricaria*; *A. aeneum*, F., *A. radiolus*, Kirby, both sweeping mallows; *A. carduorum*, Kirby, sweeping thistles; *A. meliloti*, Kirby, sweeping White Melilot (*Melilotus alba*); *A. loti*, Kirby, *A. pubescens*, Kirby, *A. violaceum*, Kirby, *A. humile*, Germ., all sweeping; *Phyllobius pomonae*, Ol., *P. viridiaeris*, Laich., *Sitones crinitus*, Hbst., *S. tibialis*, Hbst., *S. hispidulus*, F., all sweeping; *S. meliloti*, Walt., sweeping White Melilot; *S. flavescens*, Marsh., *S. puncticollis*, Steph., *S. lineatus*, L., all sweeping; *Tychius meliloti*, Steph., sweeping White Melilot; *Microtrogus picirostris*, F., *Gymnetron pascuorum*, Gyll., both sweeping; *G. antirrhini*, Pk., sweeping Yellow Toad-flax; *Anthonomus pedicularis*, L., beating hawthorn blossoms; *A. comari*, Crotch, sweeping; *Coeliodes quadrimaculatus*, L., *Ceuthorhynchus assimilis*, Pk., both sweeping nettles; *Ceuthorhynchus erysimi*, F., *C. timidus*, Ws., both sweeping *Sisymbrium*; *C. quadridens*, Pz., sweeping; *C. pollinarius*, Först., sweeping nettles; *C. picitarsis*, Gyll., sweeping *Sisymbrium*; *C. pleurostigma*, Marsh., *C. marginatus*, Pk., *C. rugulosus*, Hbst., all sweeping; *C. litura*, F., sweeping thistles; *Ceuthorhynchidius floralis*, Pk., *C. pyrrhorhynchus*, Marsh., *Amalus haemorrhous*, Hbst., all sweeping; *Rhinoncus gramineus*, F., *R. perpendicularis*, Reich., *R. castor*, F., *Magdalinus carbonarius*, F., all sweeping *Polygonum*.

MR L. HUGH NEWMAN desires to get in touch with anyone who knows of the existence of ab. *lutea*, which he wishes to introduce to his strain offspring of ab. *varleyata* × ab. *lacticolor*, and endeavour to obtain the forms which the late Rev. Raynor was so successful in obtaining many years ago.

THE ISLAND OF PLATY.

By MALCOLM BURR, D.Sc., F.R.E.S.

In the north-east corner of the Sea of Marmora there is a little archipelago known officially in Turkish as "Kizil Adalara"—that is, the Red Islands, from the dominant colour of their soil—but more generally to the world at large as Prince's Islands, of which the most famous is Prinkipo, a delightful summer resort for the people of Istanbul, which was advertised first as the place of refuge allocated to Trotzky on his escape from Russia.

Platy, i.e., Flat, in Turkish "Yasi," and Oxy, "Sharp," are the two south-westerly ones, both uninhabited. Oxy, hilly and pointed, is famous as the place of slaughter of the notorious street dogs of Istanbul. Platy is depressed, rather like an inverted saucer, and is famous locally as the scene of the whim of a former British Ambassador, Sir Edward Bulwer, who built himself a palace here about the time of the Crimean War. On both there are traces of remains of ancient ecclesiastic buildings, for these islands were used by the Byzantine emperors as places of exile for their undesirable relatives and predecessors, when they had deposed and blinded them.

The approach to Platy is dangerous, owing to the rocky shore and treacherous currents, and so access by sailing craft is not easy. But twice I have been able to get the use of a motor boat, and so been able on two occasions to spend a few hours ashore. Unfortunately, both occasions were too late in the season for the most interesting things.

The island is oval in shape, with an area of a little more than a square kilometre. The summit of the hummock is crowned by the embattlemented brick towers, reminiscent of Hurstmonceux, or Bulwer's castle, sadly shaken by earthquakes, and looted for firewood by passing fishermen. It must have been a pleasant spot in its time. Its owner planted a grove of ornamental shrubs and fruit trees around, lilac, figs, apricots, bay, almonds and others, which still survive. These not only are pleasant to the eye, but served as a windscreen against the interminable strong breezes and gales.

On my first visit, 9th August 1943, the place was desiccated by the sun and wind. It was a regular Mediterranean late summer scene, utterly different from the moist verdure of the Bosphorus, and even from the larger islands of the group, which are covered with maquis and pines. Here on Platy the background is of dry, high, wispy grass, with scabious, clumps of pungent *Diplotaxis*, *Statice*, tangles of *Asparagus asper*, with a few clumps of *Phyllirea*, *Osyris*, and *Ailanthus*, but all stunted. Here and there were prominent bushes with glaucous grey, fleshy leaves. The ground was littered by the dry stalks of the great umbellifer *Ferula*, which must be a marked feature in the landscape early in the summer, for many of them must have attained a height of nine feet or even more.

Bird life was not much in evidence. A few gulls landed, the Herring or Common, a few vague pigeons and a black and white shrike that I had not seen on the Bosphorus, a small obscure warbler, and, hanging poised high against the blue sky, the black silhouette of *Vultur monachus*, a splendid sight that had never gladdened my eye up the Bosphorus.

There are great quantities of a small lizard. This is *Lacerta sicula* ssp. *hieroglyphica*, Professor Kosswig tells me, var. *olivacea* (for it appears that the herpetologists have reached quadrinomial nomenclature), which has no black dorsal pattern. This is the dominant form on the island but on the mainland is relatively rare, for there the black dorsal pattern is the commonest.

A friend of mine who had visited the island early in July told me that he had seen, clinging to the walls inside the ruins on the shore, clusters of a huge butterfly which he had known as a small boy under the name of "Pasha with Two Tails." From his description I feel little doubt that this was *Charaxes jaxartes*? = *jasius*? for he said it was about twice as big as a swallow-tail and deeply coloured. Kosswig tells me that it is known to occur on Prinkipo, but, it seems, it is not known on the mainland.

Butterflies, however, were not numerous when I was there, and I saw no trace of *Charaxes*. There was a deep yellow *P. machaon*, *V. atalanta*, *V. cardui*, *S. megera*, *Polygonia* sp. ? and *H. phlaeas*, of which I noticed one each, and one or two small, dull blues, *C. pamphilus*, a few *P. napi* and *P. daphidice*, and a grizzly skipper. (But I am out of my depth in writing of butterflies, and offer these names merely as suggestions, based on memories of Coleman's *British Butterflies*, which introduced me to Entomology.)

Orthoptera were not greatly in evidence. I was disappointed to be too late for *Saga*, which Kosswig tells me is unusually numerous here; in fact, one of the striking members of the local fauna. This is remarkable, for in four summers tramping over the Bosphorus country I have come across only two specimens. Yet Kosswig told me he could have taken over twenty in a day on Platý. It seems to haunt the lofty *Ferula*, which are suitable for its habits of climbing to a commanding position, to pounce on its prey. How I would have liked to have observed them, and perhaps caught one in the act of pouncing, and even found a male, which, in this species, is excessively rare, for it seems to produce by parthenogenesis.

The dominant Orthopteron is *Decticus albifrons*, Fabr., far more obtrusive in his great size, huge leaps, short flights and tinkling stridulation, than on the moors and gullies behind the Bosphorus. In fact, the whole picture recalls late summer in southern Macedonia far more than the country where I have been living for the past four years. In Macedonia I used to feed my captive Sagas on *Decticus*, and a grim sight it was to see the ogre eat the monster. I daresay, as both are common here, that "macabre scene" may be frequent on this island.

Very numerous was *Tylopsis liliifolia*, Fieber., both green and the marbled form *marginoguttata*, Serv. There were some *Platycleis intermedia*, Serv., approaching the form *mesopotamica*, Ramme, in which the sixth ventral segment of the female tends to reproduce the double tubercle of the seventh. This is most frequent in the Near East, from Greece to Baluchistan, but transitional forms occur.

Of crickets, I was surprised not to notice *Oecanthus*, but it is probably there. Sweeping in some grass that had preserved a touch of greenness inside the ruins I found that curious little cricket *Megoplistus brunnerus*, Serv. It is common enough all along the Mediterranean.

The only Mantids I saw were some immature *M. religiosa*, of both the brown and green form. I found an *oetheca* on a stone that was burnt by the bush fire.

This year I was very anxious to get to Platy early in July, but the difficulties are great, and it was not until 15th August that I was able to arrange for a boat, a week later than last year.

It was a glorious day, and as we landed I felt that real still baking heat that one associates with the Mediterranean, which I had never experienced on the all too breezy banks of the Bosphorus. The consequence was that *Decticus* was positively obstreperous, and a *Tettigonia* flying nearly as freely as a butterfly, but that *would* happen when my hands were busy collecting fuel to brew coffee, so I had no net with me. Most probably it was *T. viridissima* but I would have liked to have made certain. He was bright green and kept among the green shrubbery around the castle.

The rest of the island was black and yellow, not merely buff from sun and wind, but from a bush fire that had swept the place. The ground was black and charred, and the grass all burnt off short. My trousers, until then white, were peppered heavily with black, and I felt myself back in the highlands of Angola at the close of the dry season, when the natives burn the bush. The mortality among insects must have been very great. Numerous nests of *Messor* seemed to be lifeless.

Never have I seen *Decticus* so obtrusive. The clumps of bramble among the ruins were rattling with them. But, as last year, there were not many *Platycleis*, which was a pity, as I wanted to verify which sort is dominant on the island. The few I saw were very nimble and very shy. They sprang into the air and flew down wind before I could get within reach. The stiff stumps of grass made the sweep-net almost useless. One seemed less agile than the others, and I marked it down to the lee of a stone, and caught it with my fingers as it struggled to take cover beneath it. This most unusual behaviour on the part of a Tettigonid surprised me, till I caught it, and found it was in the teneral condition. I managed to catch a male in a similar manner. It was *P. intermedia*, either *mesopotamica* or a transitional form.

Unfortunately, time was short, as the black-out had been instituted, which made it necessary to get home early. And the wind had stiffened, so that the journey, which had taken only an hour in the morning, took two and a half on the way back. It was a stiff breeze, but compared with the gale that had swept the island on my visit the previous year, almost blowing the net out of my hands and making even walking difficult, it was a gentle zephyr.

Eos, pts. 1 and 2 for 1944, have just come to our table. It consists of about 232 pp. with 11 plates and a very large number of diagrammatic text figures. There are eight articles: two Lepidoptera, two Coleoptera, two Hymenoptera, one Diptera, and one Thysanoptera. B. K. Lempke deals with races of *Phragmatobia fuliginosa*, L., with a plt.; R. Agenjo treats of the morphology and geographical distribution of *Chrysophanus hippothoë*, L., also with a plate. There is also the completion of the Supplement on the Hymenoptera of Spain, which has been running for the last two or three years.

COLLECTING NOTES.

PARASITISM OF A MERODON LARVA BY THE TACHINID, *LYPHA DUBIA*, FLN.
—Mr W. E. H. Hodson of Reading University recently sent to me for identification a Tachinid bred from a larva of *Merodon* (presumably *M. equestris*, F.) received by him, with other larvae and some pupae, from Antrom (Cornwall) in February of this year. This Tachinid proved to be a female of the very common early spring species *Lypha dubia*, Fln., reputed to be a parasite of Chrysomelid beetles as well as of Lepidoptera. Upon further enquiry Mr Hodson not only sent the *Merodon* larva containing near its posterior end the empty puparium of the Tachinid, but kindly allowed me to keep both larva and parasite, and suggested that I should place on record this undoubtedly unusual case of parasitism.

The larval stage of *Merodon equestris*, F., is passed (as is well known) within a Narcissus bulb, and the parasitized larva was found in such a position, a position in which it might reasonably be considered well protected from Tachinid attacks, but *Lypha* belongs to a group of Tachinids in which the species deposit a large number of eggs (which hatch immediately) in places frequented by their hosts, and in this case it would appear that the young *Lypha* larva, having failed to find its more usual host, attacked the *Merodon* larva instead.—J. E. COLLIN, Newmarket, 20th April 1945.

BREEDING OF *POLYGONIA C-ALBUM*.—Last year I stayed, for several months during the summer, at a little village just outside Frome, Somerset, and was very surprised to note *Polygonia c-album* in considerable numbers. Was 1944 an exceptionally good year for this insect? Although I have seen it in fair numbers in recent years I have never before seen this species in such profusion in all its stages.

During the last week in July and early August the butterfly was to be seen in sunny corners of almost every hay field and sitting on walls and shrubs by the river. On 4th August, whilst negotiating a stile I noticed two neat little holes in the leaf of a nettle at the foot of the stile. Having the larvae of *c-album* in mind I immediately investigated and found two very small larvae of this species, not more than a day or two old.

Not having taken the larvae previously I forthwith postponed my proposed afternoon with rod and line and turned my attentions to larvae instead. Careful search of the nettles in the adjoining fields rewarded me with a further 15 larvae of varying size from a few days old to nearly full grown. Usually they were in twos or threes, but occasionally single and nearly always in a warm sunny position. Nettles growing close to walls or between large stones where the heat was reflected were the places generally selected.

A few days later I continued the search at a nearby farm where there was a patch of nettles growing against one of the walls, and within a matter of a few square feet found well over 20 small larvae. Unfortunately, immediately by the wall was a large heap of cleanings from the farm's pig-sty and the smell from it was so overpowering that further search had to be abandoned. It was a pity as the nearer I got to the heap the more abundant became the larvae, but then one's stomach can only stand so much at a time!!

It would seem, however, that the stomach of *c-album* is of much sterner stuff, as the good lady who was responsible for the larvae must

have spent a considerable time in the neighbourhood and I wouldn't be surprised if she even *liked* it! This leads one to wonder if this species shares the same depraved taste as does *A. iris* and, if so, may be a clue to finding larvae. No, thank you?—well, there it is.

Later in the month I found many pupae suspended from the nettle stalks, walls, etc. The imagos all emerged between 20th August and 15th September and not a single larva or pupa was ichneumonised.

During the last week in August the larvae of *L. argiolus* were also in great profusion on the Ivy buds throughout the district.—R. W. ADAMS, 16 Kenton Gardens, Kenton, Middx., 19th March 1945.

THE HABITATS OF *CHORTHIPPUS BICOLOR*, CHARPENTIER, AND OF *C. PARALLELUS*, ZETT.—I was extremely interested in Mr J. A. Whellan's article on the habits of British Orthoptera (*antea*, pages 6-8), especially in his notes on the kinds of habitat preferred by *C. bicolor*, Charpentier, and *C. parallelus*, Zett. He mentions that "At Bexley Heath *bicolor* seemed to prefer the dry heath proper and *parallelus* tended to replace it in the lush grass towards the ponds." I confirmed this preference of *parallelus* for a moister habitat in 1944 while sweeping for Orthoptera and Diptera in a grassfield at Fancott, Bedfordshire. The field is divisible into two separate areas: (1) an extremely rough grazing on wet soil, containing *Juncus glaucus*, *Carduus arvensis* and *Ononis spinosa*, L., and (2) a chalk-downland type of grazing on higher ground containing *Viola* sp., *Luzula campestris*, DC., and *Primula veris*, L. *C. parallelus* was definitely more common in habitat (1), being abundant here (nymphs and adults), with *Omocestus viridulus*, L., and rare in habitat (2). The reverse was generally true for *bicolor*.

O. viridulus was exceptionally common stridulating in the tufts of grass which commonly surrounded *Ononis spinosa*; while *C. parallelus* was usually found in the more open spaces. *C. bicolor* definitely prefers dryer ground and is often found in the exceptionally dry stubble fields overlying the chalk scarp.

Unfortunately no figures are available to show the relative numbers of the species occurring, but I hope to do some work on this subject this year.—B. R. LAURENCE, 31 Sherwood Road, Luton, Beds., 6.v.45.

SPRING MIGRANTS AND EARLY BUTTERFLIES NEAR DEAL, KENT.—With the opening of warm weather in the third week of March, hibernated butterflies appeared in numbers in this district. *Nymphalis io* was everywhere abundant in the E. Kent woods, but I saw very few *Aglais urticae*. On 23rd March I saw a male specimen of *Pieris rapae* (or possibly *P. napi*) on the wing, and other fresh species on the following dates:—6th April, *Celastrina argiolus*; 9th April, *Pieris napi*; 13th April, *Pieris brassicae*; 18th April, *Euchloë cardamines*; 8th May, *Satyrus megera* and *Argynnis euphrosyne*, etc. During the latest heat-wave, just over, migrant insects appeared as follows:—8th May, one *Vanessa cardui*; 9th May, one *V. atalanta*; 10th May, one *Macroglossum stellatarum*; 12th May, one *M. stellatarum* and another *Vanessa atalanta*. By this date *V. cardui* had become plentiful, and was to be seen in the woods feeding greedily on Bugle blossom. *Plusia gamma* was first observed on 11th May. I have been impressed with the abundance of *Pieris brassicae* and *Celastrina argiolus* in this district.—C. M. GÜMMER, Pleinmont, Manor Road, Deal.

A DRAGONFLY RECORD.—In July last year I took a female *Aeshna cyanea* in Bramhall Park, Cheshire. As this species, though common in Southern counties, has been taken on only a few occasions in the North, it is possible that it is frequently overlooked.—E. JOHNSON TAYLOR, Crantock, 25 South Parade, Stockport, Cheshire, 5.5.1945.

DWARF EUCHLOE CARDAMINES.—Whilst cycling along the canal bank near Pontypool, I caught a ♂ *cardamines* with a wing span of 29 mm., whereas my next smallest is 38 mm. Is this exceptionally small? In South, specimens are mentioned not more than $1\frac{1}{4}$ inches = 32 mm. in expanse. As mentioned in South, the orange patch does not extend beyond the discal spot.—M. P. SIDDON, Trosnant Lodge, Pontypool, Mon.

CYLINDROTOMA DISTINCTISSIMA, Mg.: A FURTHER NOTE (DIPT.: TIPULIDAE).—I was very interested in Mr T. Bainbrigge-Fletcher's note on *Cylindrotoma distinctissima*, Mg., *antea*, p. 46, as in 1930 I had the pleasure of rearing this fly from larvae which were found by Mr H. Britten feeding on the uppersides of the leaves of the marsh marigold, *Caltha palustris*, L., at Rostherne, Cheshire (1931, *Northw. Nat.*, vi, pp. 17-18, 1932; *ibid.*, vii, pp. 314-315). The superficial resemblance of the larva to that of a sawfly is very striking. A detailed account of the life-history of a Canadian species, *C. splendens*, Doane, is given by Cameron (1918, *Ann. Ent. Soc. Amer.*, xi, pp. 67-89, 18 figs.). At that time this represented the first record of the finding of the immature stages of *Cylindrotoma* on the American continent. In my 1932 note (see above) I invited entomologists who may have observed these larvae to communicate with me, but Mr Bainbrigge-Fletcher's note is the only record of which I have heard. In spite of repeated searching, I have never succeeded in finding any larvae myself. I should indeed be very interested to hear of any further records of these leaf-feeding Tipulid larvae.—ERNEST TAYLOR, Hope Department of Entomology, University Museum, Oxford, 23.iv.1945.

KING GEORGE BUTTERFLY.—In a recent issue of the "Sunday Express" a correspondent mentioned a "King George 'Butterfly' (!)" On the following Sunday a lepidopterist, whose name I forget, wrote to the paper in question to say he had never heard the name before for any Lepidopteron. I have just remembered that the late Miss F. J. Kirk told me that when she was a little girl living at Weybridge they always spoke of the "Tiger Moth" (*Arctia caia*, L.) as "King George." I thought this might be of interest for our lepidopterists.—HORACE DONISTHORPE, Entomological Department, British Museum (Nat. Hist.), 20.iv.1945.

DIPTERA, ETC., SWEPT FROM A REED BED (SPARGANIUM RAMOSUM, HUDS.).—On 8th July 1944, while collecting near Fancott, Bedfordshire, I came across a rather local association of insects in a reed bed containing *Sparganium ramosum*, Huds., and *Scrophularia nodosa*, L. A tree trunk had fallen across a small stream (about six foot wide) and had accumulated branches, etc., slowing up the stream and making way for the reeds. Above the trunk *Scrophularia nodosa*, which was just beginning to flower, and *Sparganium ramosum* grew in profusion, while amongst the plants

was also a little *Lemna minor*, L. The whole habitat has since been cleared away. I did, however, manage to record six species of *Diptera*, seemingly endemic to this habitat, five of which belonged to the sub-order *Brachycera* and two of which are rather locally distributed in Britain, namely *Gnophomyia lugubris*, Zett. (Tipulidae-Limnobiidae) and *Xylomyia marginata*, Mg. (Erinnidae).

Both have larvae which feed on rotten wood and the larva of *Xylomyia* is found in the debris in hollows in Elm, Oak, Walnut and Poplar. The two former trees are common in the district and the habitat lies quite near to a partly neglected wood containing both these trees. Little seems to be known of the habits of the adult *Xylomyia*. Verrall, who first introduced it to the British list upon two males, one taken at Wicken, 1875, and the other at Exning, 1882, records Dr Sharp taking about 60 females in about an hour on some felled Walnut (*Brit. Flies*, Vol. v, 1909, p. 227). All my specimens are female. Both of the above species were reasonably common, *Xylomyia* resting on the leaves of the reeds while *Gnophomyia* was caught usually flying from one reed to another.

Other *Diptera* noted were *Chloromyia formosa*, Scop. (Stratiomyidae) (common, ♂ and ♀); *Beris vallata*, Mg. (Stratiomyidae) (rare); *Chrysopilus auratus*, Fab. (Rhagionidae) (common), and *Dolichopus unguatus*, L. (Dolichopodidae) (common).

The common wasp, *Vespa germanica*, Fab., occurred in large numbers, attracted no doubt by the Figwort (*Scrophularia*). Two aquatic Hemiptera were noted on the surface of the water, *Velia currens*, Fab., and *Gerris lacustris*, L., while the froghopper, *Aphrophora alni*, was extremely common on the reeds.

I have to thank Mr H. Audcent for identifying the *Diptera* and also for information on the habits of *Gnophomyia* and *Xylomyia*.—B. R. LAURENCE, 31 Sherwood Road, Luton, Beds, 6.v.45.

LIGHT STIMULUS TO STRIDULATION OF A LEPIDOPTERON, *EUPREPIA PUDICA*, ESP.—The happy prospect of soon being able again to observe the behaviour of nocturnal insects under the stimulus of artificial light, and the outstanding associated bio-psychological and physical problems, prompts me to record a pre-war observation.

On 19th September 1934 I was having supper ashore at Makarska, a small port on the Dalmatian coast of Yugoslavia, about 40 miles south of Split. The narrow coastal strip between the sea and the steep hills is well wooded with conifers, and restaurant tables were dotted amongst these, each table with its own lamp.

A number of ♂ *Euprepia pudica*, Esp., were attracted to the lights. These "Tigers" flew fast and spiralled around the lamps in silence at first; I then noticed that at a certain point, apparently determined by the closeness to the light source, they would suddenly begin to stridulate loudly whilst in flight. In three cases specimens settled on the white tablecloth, and *with the wings still vibrating*, but the insect stationary, continued to stridulate until boxed, when the emission of sound ceased with folding of the wings.

Spuler, in *Die Schmetterlinge Europas*, Band II, page 139, notes the possession of a large drum-like organ situated under the metathorax; these are remarkably large, and apparently of transparent pale ochreous-chitin in my insects, one on each side. The nature of the sound emitted

judged by ear is a mixture of very high audible frequencies modulated in amplitude, between five and ten times per second. The effect is not unlike that of some grasshoppers but with a higher modulation frequency.

I regret that I have neither the means nor the skill for examining the structure of the insect in order to ascertain the means of exciting the "drum," but this can apparently be done at will by the insect.

It would be of great interest to know:—(a) Why nocturnal insects in general are attracted by artificial light, an experience to which their ancestors must have been much less prone? My limited reading has thrown no light on this problem. (b) Why *Euprepia pudica*, Esp., has the power of stridulation? Observation of sexual behaviour in the field may throw light on this. I believe it to be a rare phenomenon in Lepidoptera. (c) Why the stimulus of light apparently excited the insects to stridulate? Bio-psychology, of which I am lamentably ignorant, may perhaps assist here.—Commander G. W. HARPER, R.N.

CURRENT NOTES.

DR MALCOLM BURR sends his cheery greetings from Istanbul to all old friends and would be very pleased to hear news from any one.

THE final portions of the publications of the R.E.S. for 1944 with the exception of the final part of Section C devoted to the business matter and List of Fellows, has just (February) come in. The *Transactions*, pt. ii, of vol. 94, some 200 pages with 17 plates and numerous line figures in the text, contain seven major articles, four of which deal with Lepidoptera and three with Coleoptera. Prof. G. D. Hale Carpenter discusses the geographical variation of *Limenitis bredowi*, Geyer, of N. America; the twenty-two figures on the four plates are a great help to the understanding of the text. N. D. Riley treats of a section of the Lycaenidae and of the Riodinidae; the two plates contain 37 figures showing the undersides of the critical species. G. Talbot gives a Revision of the difficult Pierid group of *Mylothris*, and E. B. Ford gives the results of his Study of the Pigments of the Lepidoptera (Papilionidae). The two Sections, A and B, contain all the smaller papers read, some eleven in number, in pts. 7-12 of the former Section and twenty in pts. 7-12 of the latter Section. The smaller contributions in Section B (Taxonomy) and in Section A (General Entomology) contain one article on Lepidoptera, five Coleoptera, five Diptera, four Hymenoptera, two Odonata, two Orthoptera, and one Thysanoptera. The work goes on well as usual.

THE *Revista Argentina de Entomologia*, No. 4, Vol. 2, in its 76 pp. contains more than a dozen small contributions, most of them well illustrated. This *Revista* is produced by Dr Ernesto D. Dallas. Several articles deal with Coleoptera, with figures. There is an illustrated article on Mass Movements of various species of Insects with an explanatory map. Various notes are contributed on aberrations of Lepidoptera, including a *Colias lesbia*, with figures representing three well-known forms; another is an anomalous form of *Eurota jorgensis*. Of *Tatochila wolxemi*, *Heliopetes leca*, and *Vanessa carye* illustrations are also given.

IN the *Entomological News* (Amer.) for last November there is the first of a series of articles on Nomenclature, which Amateurs should pause to think over. The first Essay is "The Naming of Infra-Specific Categories," by E. G. Linsley of the University of California. If nothing else, the difficulty of labelling the numerous categories is illustrated and an analysis is given for and against what should be named.

IN the Notes on Entomology in the December number of the same magazine a writer attempts the Classification of Entomologists. He divides them into three categories according to the depth of intellectual study of the individual. "There are one-story intellects, all fact collectors who have no aim beyond the facts. Two-story men compare, reason, generalize, using the labours of the fact-collectors as well as their own. Three-story men idealize, image, predict, etc." It is really the adoption of an idea of Oliver Wendell Holmes, the American literary writer.

WE have received from Bagdad, Iraq, *The Butterflies and Moths of Iraq: their Distribution, Phenology, Ecology and Importance*, by E. P. Wiltshire, F.R.E.S. Hitherto what we have known of the Lepidoptera has been reports of comparatively short visits. In this case the author has spent several years at work in all parts of the district and is able to give the life-history of a good many species. In all there are 528 species dealt with—114 Butterflies; 62 Bombyces (so-called); 90 Noctuae; about 70 Geometers; the rest are doubtfuls and those species which occur just over the frontiers and more probably occur at times in the country. The work was published under the Agricultural Directorate, Bagdad, and economic references are noted where known. There is a plate with diagrammatic figures of some 15 species new to science and 7 figures giving the variation in the marking of the larvae of four species of *Cucullia*. The work is so well annotated that it will not fail to be of great use to future workers in the area, as the author's personal notes are invaluable.

OUR correspondent, Kenneth J. Hayward, has sent No. 3 pamphlet written by him, probably the last published before his taking up his new post in the Lillo Institute, and also part xiv of his "Hesperoidea Argentina." His pamphlets deal with Aphides, Aleyrodes and their Control, and Additions to the List of Insects of Tucuman.

WE have received a copy of one of the "Penguin Books" series for review, entitled *Some British Moths*. There is not much in it, 32 pp. and 16 plates, in colour. First, it is not a child's book. The author has given us a digest, not only of his own life-study, but the cream of the accumulated studies in the Science of Entomology, by all who have passed away, from the Chinese or Aristotle, to the work of those who have followed the lead of the illustrious Darwin. Moth, caterpillar, and chrysalis are charmingly dealt with. The instigation of this little brochure was the acquisition from the Library of the late Lord Rothschild by the British Museum Library (Nat. Hist.) of a series of remarkable, unpublished plates painted by Moses Harris, which formed the basis of the famous *Aurelian* published in 1766. We congratulate Norman Riley on his little book, 'tis a "Multa in parvo" (Many things in little).

NOTE.—Where did Moses Harris get his inspiration? I suggest it was from the Dutch book by Jacob L'Admiral with about 25 coloured plates folio, 1720?5-1744.—HY. J. T.

THE No. 3 of Vol. 12 of the *Revista Soc. Ent. Argentina* in its 72 pages contains eight main articles with various Notes and a Bibliography of Argentine publications. There is an account of the great entomologist of past Argentina, Burmeister, with four portraits of him taken at different times in his life. Our correspondent, Kenneth J. Hayward, contributes pt. xiv of his "Hesperoidea Argentina." There are three articles on Coleoptera and one on Orthoptera.

THE last part, 6, of vol. 2 of the *Journ. of Brit. Ent.*, published in 1944, contains the usual quota of useful entomological matters, including five on Diptera, two Lepidoptera, two Odonata, one on Orthoptera, one on Hymenoptera, and one on insects visiting flowers. The records of the capture of *Celerio lineata*, ssp. *livornica*, in this country in 1943, and An Account of an attack on *Pieris brassicae* by birds.

THE LONDON NATURAL HISTORY SOCIETY.—The Minute Secretary, Mr H. J. Burkill, reports that Mr A. B. Hornblower, who was appointed Hon. Secretary sixteen years ago, is retiring through illness, and his place is now taken by Mr H. A. Toombs, whose address is British Museum (Natural History), Cromwell Road, S.W.7. The Meetings of the Society, which were held on Saturday afternoon for the last few years owing to black-out regulations, are now being resumed for Tuesday evenings as in pre-war years. Recent meetings of the Society have included a paper by Dr E. A. Cockayne (postponed from an earlier date owing to conditions) on the "Life and Work of the late L. B. Prout;" a lecture by Mr R. Wagstaffe of the York Museum on "Museum and Field Work and their inter-dependence;" a talk by Major T. A. Cockburn, M.D., on animal life on the Gold Coast with an account of his work on the mosquito, *Aedes aegypti*, a vector of Yellow Fever.

OBITUARY.

FERDINAND LE CERF.

We regret to learn, without any exact details, of the recent death in Paris of Ferdinand Le Cerf, for many years in charge of the Collection of Lepidoptera in the Natural History Museum there. As he had been a member of the Entomological Society of France since 1901, he must have been sixty or over. He was also a Fellow of the Entomological Society of London from 1920 to 1939. Besides being Editor of the Lepidoptera portion of the *Encyclopédie Entomologique*, of which three volumes appeared 1925-1929, he wrote a large number of papers scattered in numerous publications; he was especially interested in the Aegeriadae of the World and produced several valuable contributions to their study. In 1932 he was occupied in compiling a book on the Lepidoptera of France, to be published by Lechevalier, somewhat on the lines of "South" but to include the Micros. also, but he wrote that it was being delayed by the illustration-work, that on the larger species being in good progress but the smaller species offering great difficulties, and that the work would have to be abridged because of the large number (about 3400) species of Lepidoptera in France—ultimately other difficulties supervened and the book was never published, so far as we know.—T.B.F.

bright green markings, arranged as in *atriplicis*, the bifid white spot less pure in colour and rather larger; secondaries, abdomen and under surface altogether darker than in *atriplicis*." Yokohama. [Now considered a species.]

race *similis*, Stdgr., *Rom. Mem.* (1892), VI, 456.

FIG.—Plt. 9, f. 1 (1892).

ORIG. DESCRIP.—"The dark grey examples are far more spotted dull yellow-green, especially in the disc, with almost similarly coloured short, but far deeper teeth to the forked spot. Thus this species appears far less variegated, marked and coloured. The two stigmata stand out much less, the orbicular is not apparent. The usually so strikingly whitish forked spot appears less emphasized, is shorter, deeper forked, and dull yellow-brownish coloured." Amur.

ab. *immaculata*, Slevogt. ?? [See Drdt.-Stz., *Pal. Noct. Supp.*, III, 169 (1934)].

DESCRIP.—"Stigmata of forewings are contingent, the blotch mark is quite absent."

ab. *diffusa*, Splr., *Schmett. Eur.*, I, 210 (1906).

ORIG. DESCRIP.—"Not at all rare are aberrations with washed out marking and obsolescent pale double-toothed spot."

ab. *inornata*, Alph. (1908), *Hor. Ross.*, XXXVIII, 593.

DESCRIP.—[Ex. Seitz, *Pal. Noct. Supp.*, III] "Differs from the type by the complete absence of green coloration on body and wings. Probably *deviridata* and *deviridella* are simply Synonyms." Sarepta and Kasan.

ab. *enarismene*, Slasts. (1910), *Hor. Ross.*, XL, (1), p. 79.

DESCRIP.—[Drdt.-Stz., *Pal. Noct. Supp.*, III, 169 (1934)] "Is probably the same (as *immaculata*) although in the original description only the absence of the blotch mark is mentioned without any mention of the stigmata." Esthland.

ab. *deviridata*, Klem., *Spraw. Kom. Krak.*, XLVI, 11 (1912).

ORIG. DESCRIP.—"Alis anterioribus violaceo griseis viridi mixtis."

ab. *deviridata(ella)*, Klem., Strand.

ORIG. DESCRIP.—"Without any green marking." (See Hamp., *Lep. Phal.*, VII, 151, 1908.) Named by Strand in (1915) *Arch. Naturg.*, 5, LXXXI, A, 11, 182, "Ohne irgendwelche grüne Zeichnungen." Europe, etc.

ab. *deviridella*, Strand, new name for *deviridata* (1915), *Arch. f. Naturg.* (1915), A, 11, p. 155, nec Klem. 1911. European forms present no green marking.

ab. *epixanthana*, Mazger, *Lamb*, XXVIII, 59 (1928).

ORIG. DESCRIP.—"Anticis insuper alis areae et notae apud typum viridante in flavidas mutatae distinguuntur." "Chez le type l'aire basale et l'ombre devant la ligne submarginale ainsi que la macule supérieure sont vert clair vif; dans l'exemplaire aberrant la teinte est jaune

bien caractérisé. La tache blanche d'ordinaire teinte de rose est ici franchement blanche..”

“The example is very fresh, captured wild, it cannot be any question of *ab. suffusa*, Splr.; the markings are otherwise well developed.” Neuilly (France), 10th July 1927.

ab. olbreusei, D. Luc., *Bull. S. e. Fr.*, XXXVII, p. 169 (1932).

ORIG. DESCRIP.—“*Alis anticis supra haud albido maculatis.*” To this L'homme, *Cat. Lep. Fr.*, I, 727 (1935) added, “Extension of the green to include the whitish spot below the reniform.” Gironde. Vendée. Lucas considered it “A very extreme melanio form on all four wings.”

Hadena, Ochs. & Tr. (1816-25), Gn., Barr. [*Polia*, Ochs. & Tr. (1816-25), H.-S.: Hamp. (*atlantica*), Warr.-Stz., Culot, Drdt.-Stz.: *Melanchnra*, Hb. (1820), Meyr., Meyr.: *Mamestra*, Hb. (1821), Dup., Hamps., Stdgr., Splr., Sth., Rebel] *dissimilis*, Knoch (1781).

Tutt, *Brit. Noct.*, III, 86 (1892): Meyr., *Hand.*, 84 (1895): Barr., *Lep. Brit. Is.*, IV, 177, plt. 157, 1 (1897): Stdgr., *Cat.*, III, ed. 157 (1901): Hamp., *Lep. Phal.*, V, 99 (1905): Splr., *Schmet. Eur.*, I, 171, plt. 36, 12 (1905): South, *M.B.I.*, I, 242, plt. 121, 2 (1907): Warr.-Stz., *Pal. Noct.*, III, 71, plt. 16f, g (1909): Culot, *N. et G.*, I (1), p. 102, plt. 17, f. 7 (1911): Meyr., *Rev. Hand.*, 155 (1928): Drdt.-Stz., *Pal. Noct. Supp.*, III, 99 (1934).

Esp., *Abbild. Noct.*, IV, 2 (1), 426, plt. 136, f. 1-3 (1788+?), described and badly figured three forms under the name *w-latinum*, of which fig. 3, a dark red-brown mixed with ashy-grey, almost unicolorous, was considered to represent a var. of *dissimilis*. Werneb. and others called 1 and 2 *thalassina*, Treit., and H.-S. placed them to *genistae*. Fig. 3, which is named by Esp. *w-latinum* var., Werneb. placed to *oleracea*, L. (*suasa*, Tr.). The figures are not good, especially 1 and 2. The dominating feature of all three is the w.

Esp., *Abbild. Noct.*, IV, 2 (1) (1790), 491, plt. 150, 5, gave another figure under the name *leucographa*, which is considered a Syn. of *dissimilis*.

Ernst & Engram., *Pap. d'Eur.*, VII, 100, fig. 478a, b, c (1791), gave three figures of the species described by Knoch, *dissimilis*. Figures a, b are undoubtedly *oleracea* (teste Werneb., *Beitr.*, II, 119), and 478c is considered to be a form of *satura*, Schiff. (*adusta*, Tr.): teste Werneb., *l.c.*

Bork., *Naturg. Noct.*, IV, 457 (1792), noted that Schiff. was the first to list this species, for which he used the name *suasa*. But Schiff., *Verz.*, 83, O. 18 (1775), gave no description. Bork. gave the description made by Knoch, “*dissimilis*” = das unähnliche, Weibchen, spirilinguis, cristata, alis deflexis crenatis: superioribus hepaticis, macula conica, lineaque bidentata (1781).

Bork., *l.c.* (1792), gave the description of *dissimilis*, Knoch, under the name *suasa*, Schiff., which, although prior (1775) was non-descript. Bork.'s *suasa* thus becomes a Syn. Spuler was evidently aware of this position and he omits all reference to the name *suasa*, Bork. or Schiff.

Haw., *Lep. Brit.*, 190 (1809), described this species, a form of *dissimilis* (*suasa*), under the name *dens-canis* (teste Hampson, who treated the name as a Syn.).

Illiger, *Neu. Ausg. Verz.*, I, 278 (1801), cited references to *thalassina* + *advena*, both in error as pointed out by Treit., V (2), 136.

Hb., *Samml. Noct.*, 426, a very dark suffused example with obsolescent markings; Hb.-Gey., 803 (1832-3), is the figure of a small rather narrow winged form, one of the lighter aberrations, under the name *permixta*.

The *dens-canis*, Haw., was one of the uncommon dark examples of the continental facies rarely met with in Britain. It has been considered as a Syn. by authors.

Treit., *Schmett.*, V (2), 136 (1825), gave a long detailed description under the name *suasa* and recognized *w-latinum*, Esp., *leucographa*, Esp., *suasa*, Schiff., Bork., Hb., and *dissimilis*, Knoch, View., Fuess., and he also cited *Pap. d'Eur.*, VII, 100, fig. 478.

Dup., *Hist. Nat.*, VII, 29, plt. 102, fig. 1 and fig. 2 ab. (1827), dealt with a species described by Ochs. & Treit. and figured by Hb. 441 under the name *aliena*. Subsequently it was found that there was a form of *suasa* (*dissimilis*), which much resembled *aliena*, Hb. Dup., *l.c.*, *Supp.*, III, 323, plt. 30, 1 (1836), described a form of *suasa* under the same name *aliena*. Gn., *Noct.*, VI (II), 100, dealt with this form as *suasa* var. *errata*, a form which has been overlooked until Drdt. in Seitz., *Pal. Noct. Supp.*, brought it forward. Duponchel obtained this insect for his *Supp.*, Vol. III, from Eversmann, it was taken in S.E. Russia.

H.-S., *Sys. Bearb.*, II, 254 (1850), said that Hb. 426 was "too dusky."

Gn., *Hist. Nat.*, VI, 99 (1852), took the nondescript name *suasa*, Schiff., for the ordinary more or less concolorous dark form of the Continent to which Knoch had given the name *dissimilis* (1781). Thus the name *suasa* becomes a Syn. Gn. then under A referred to the form common to Britain and the W. of France, with markings very well expressed, the stigmata large and close together, the subterminal line well developed and very neatly folded (for the W). He then dealt with a form under the name *aliena*, Dup. (nec Hb.), as a good species and finally included the form *w-latinum*, Esp.

atlantica, Grote, *Bull. Buff. Soc. Nat. Science* (Am.), II, 12 (1874), described a Noctuid from Canada and the U.S.A. under this name. Subsequently in 1881, *Can. Ent.*, XIII, 128, he referred to it as a form of *dissimilis*, in the B.M. series in which Butler had included it.

discolor, Speyer, *Stett. e. Ztg.*, 36, 142 (1875), described a form of *dissimilis* from Frankfort, etc. This Grote said was the same as *atlantica*.

Barrett, *l.c.*, plt. 157, gave four figures, but none of them show the pale purplish-brown (a fading colour): 1, a ♂ with unusual contrast of colour, the interrupted submarginal area being almost white in contrast to the umbreous brown general shades; 1a, a ♀ an almost uniformly darkish umbreous brown with suppressed marking except the conspicuous white submarginal line; 1b, a very similar ♂; 1c, a very dark ♂ with suffused obsolescent marking; in no figure is the \geq mark typically expressed.

Stdgr., *Cat.*, IIIed., 157 (1901), gave *suasa*, Bork., *aliena*, Dup., *laeta*, Reut., *atlantica*, Grote, and *permixta*, H.G., as abs. with *confluens*, Ev. (al. ant. obscurioribus, fere unicoloribus) and *extincta* (obscurior, al. ant. flavido-signatis): ab. *laeta*, Reut. (laetius picta).

Splr., *Schm. Eur.*, I, 171, plt. 36, 12 (1905), under the name *dissimilis*, Knoch, gave a figure of a yellowish example. He omitted all use of the

name *suasa*, and dealt with *w-latinum*; Esp., *laeta*, Reut., *extincta*, Stdgr., and described ssp. *turanica* from Central Asia.

Hamp., *Lep. Phal.*, V, 99 (1905), referred to Schiff., *Verz.*, 83 (1775), and to Hb., *Noct.*, 426, for name *suasa* and type example. Also he included *permixta*, Hb.-Gey., 803, and *pavida*, Gn., *Hist. Nat. Noct.*, VI, 101. He admitted the two aberrations *confluens* and *extincta*, Stdgr.

South, *M.B.I.*, I, 242, plt. 121, 2 (1907), gave a good figure of the "reddish tinged pale brown Essex form." Some of the British examples are sooty-brown. Other forms may be purplish or reddish-brown.

Warr.-Stz., *Pal. Noct.*, III, 71, plt. 16, f. 9 (1909), gave seven figs., *dissimilis* ♂ and ♀, *suasa* ♂ and ♀, *laeta*, *w-latinum*, and *confluens*, all very poor figures. They treated *leucographa*, Esp., and *dens-canis*, Haw., as synonyms of *dissimilis*: *aliena*, Dup., syn. of *suasa*: *w-latinum*, Esp. (nec Hufn.): *confluens*, Ev. as the same as *pavida*, Gn., and included *laeta*, Reut., *turanica*, Splr., and *extincta*, Stdgr.

Rebel in *Berge-Schmet*, Ed. 9, 181 Note (1910), noticed Bork. was in error in using the name *suasa* for Knoch's description. He described the most variegated form (the same as the British average form and named it *variegata*. He cited Barrett, *l.c.*, IV, plt. 157, 1, as the best figure.

Culot, *N. et G.*, I (1), 102, plt. 17, 6-7 (1911), gave two very dark very featureless figures, one of which he said was the obscure and dark Russian form *confluens*, Evers. He said it was the *aliena*, Dup.

Drdt.-Stz., *Pal. Noct. Supp.*, III, 99 (1934), added three forms: (1) *errata*, Gn., a Swiss form; (2) ab. *variegata*, Rebel, the most variegated form, and the common English form, (3) *distincta*, Heinr., from Digne.

Barrett reviewed the Variation—

"Very subject to local variation. In some of its localities in Essex as well as in S. Wales, the forewings are broadly suffused with smoky-brown, or blackish-brown, more especially in the middle, though sometimes extending over the whole area; elsewhere on the coast, as in Suffolk and S. Devon, and more frequently in the mosses of Lancashire and Cheshire, it becomes of a singular, smooth, almost uniform purple-brown, paler or darker and in many instances with all the markings, except the subterminal line, greatly obscured; this peculiar variation ranges almost from red-grey, and these ground colours are also found in the same localities associated with great distinctness and intensity of the usual markings. The Rev. W. W. Fleming has obtained extremely dark purple-brown specimens near Waterford, the subterminal line being rich yellow, but the other markings scarcely visible. A curious aberration reared by Mr W. H. B. Fletcher has the forewings quite abnormally broad and the transverse lines and stigmata extraordinarily conspicuous."

The Names and Forms to be considered—

dissimilis, Knoch (1781), *Beitr. zur Ins.*, 57, plt. IV, 1-4.

ab. *w-latinum*, Esp. (1789+?), *Abbild. Noct.*, IV 2 (1), 426, plt. 136, 3.

leucographa, Esp. (1790+?), *l.c.*, IV 2 (1), 491, plt. 150, 3. Syn.

f. *suasa*, Bork. (1792), *Naturg. Noct.*, IV, 457 (pale brownish mottled with black).

dens-canis, Haw. (1809), *Lep. Brit.*, 190. Syn.

ab. *permixta*, H.-G. (1832-3), *Samml. Noct.*, 803.

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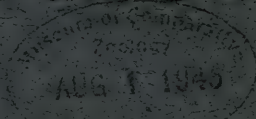
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MALCOLM BURR, D.Sc., F.R.E.S.

E. A. COCKAYNE, A.M., D.M., F.R.E.S.,
F.R.C.P.

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By HENRY J. TURNER, F.R.E.S., F.R.H.S., *Editorial Secretary.*

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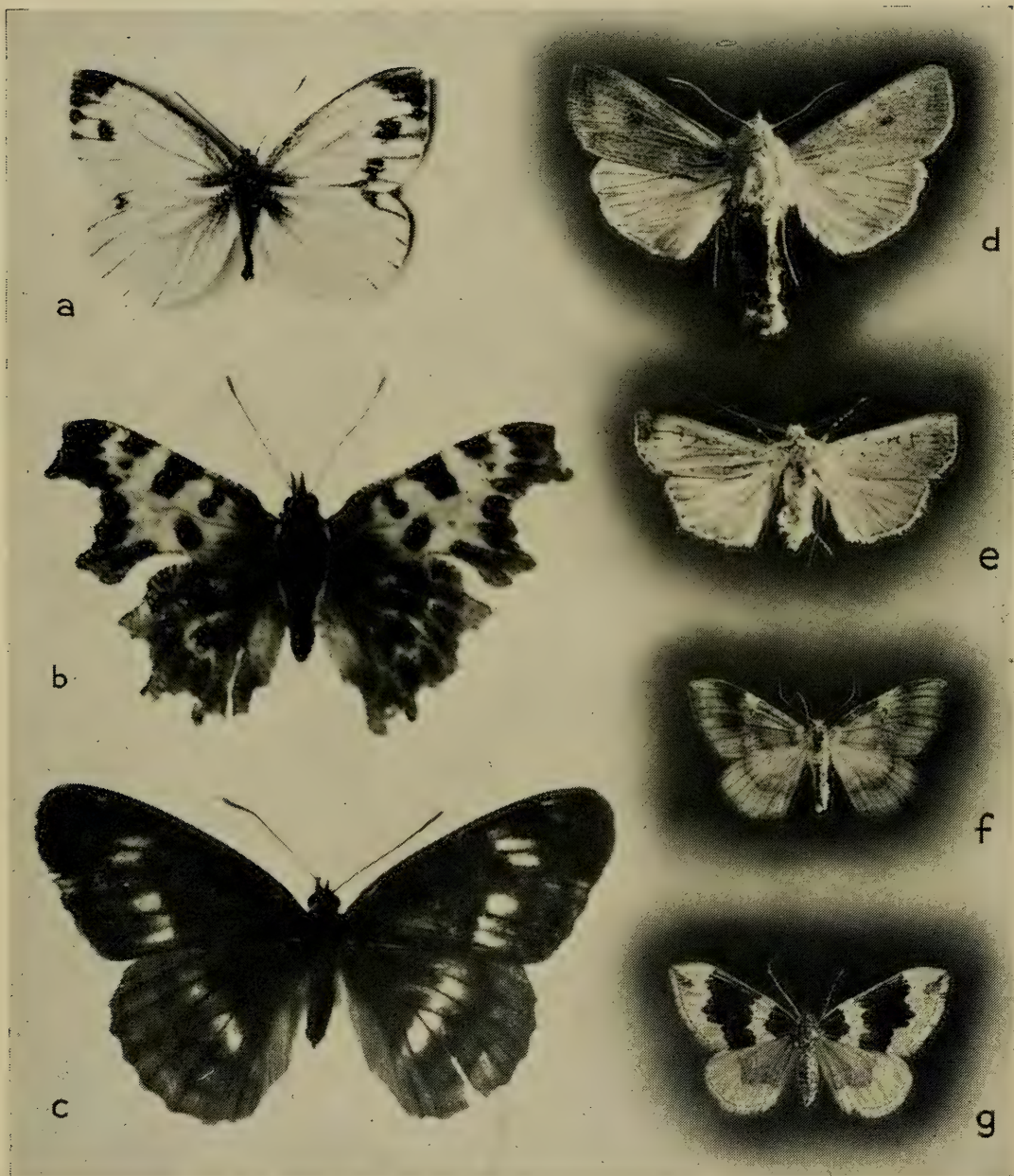
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SOME CAPTURES OF NOTABLE ABERRATIONS OF LEPIDOPTERA.

SOME CAPTURES OF NOTABLE ABERRATIONS OF LEPIDOPTERA

Recorded recently by Members of the Amateur Entomologists' Society.

Plate III.

Fig. (a). A gynandrous *Pieris napi*, ab. *citrona*, bred by L. G. Waddington, August 1943.

Fig. (b). A partially melanic example of *Polygonia c-album* taken by R. S. Ferry, Wellwyn, Herts, 3.viii.43.

Fig. (c). A *Limenitis camilla* with asymmetrical white bands taken by L. B. Clarke in Glos., 2.vii.1944 (photo. E. G. Neal).

Fig. (d). *X. zollukoferi*, taken by A. Kennedy, at sugar, Kirkstall, Leeds, 29.viii.39.

Fig. (e). A Noctuid taken near York by William Hewitt, about 1900. Now in the collection of A. Smith. Mr Tams (Brit. Mus.) has been unable to determine it.

Fig. (f). *Xanthorhoë montanata*, a new aberration taken by A. Kennedy at Kirkstall, Leeds, vi.1942. See Dr E. A. Cockayne (*Ent. Record.*)

Fig. (g). *Lampropteryx suffumata*, ab. *porrittii*, taken by A. Smith, Bishop's Wood, Selby, Yorks, April 1942.

The Plate and accompanying letterpress were very kindly lent to us by the Society: a useful item on the "Journal of Variation" side of our Magazine.

70 NEW RECORDS OF LEPIDOPTERA FROM IRAN**AND A FEW OTHER NOTES ON PERSIAN RHOPALOCERA.**

By E. P. WILTSHIRE, F.R.E.S.

The Lepidoptera of Iran (Persia) have, within the last decade, been intensively collected and studied, but the war has intervened to prevent consultation between the scattered students and to delay even the piecemeal publication of their results. If all their material survives the present world conflagration, it will make possible a very comprehensive Faunal List for Persia. At present anything so ambitious is not to be attempted.

Yet it is desirable, for the sake of zoogeographers and others, to report fairly promptly the discovery in Persia of species not previously known to occur there, and this is the primary object of the present short paper. It reports my capture there of 70 Macro-Lepidoptera new to Persia, which is of course a very small fraction of the total species I have observed there. Several of those included have already been mentioned as occurring in Persia in articles by me on Syria or Iraq or on general insect phenology and ecology, but a student compiling a Persian faunal list might not think of referring to those articles and would find it helpful to have those records collected here in one article; he would, however, also have to refer to the "A" works listed in the bibliography at the end of this article, if his list was to be complete, for the species listed in those works are omitted here, except for a few Rhopalocera, included here in order to correct mistakes recently published about them or, in one case (e.g. *louristana*, Le Cerf) to report the rediscovery of a rare

race in a new locality; these exceptions are in brackets and not numbered below. Detailed discussion of the prevailing form or range of variation is deliberately avoided, though the race-name is given where it could be ascertained in my preliminary study of the material. Ecological details are also omitted, but the bibliography mentions some works in which Persian biotopes are described. The locality of each record is however given, with its province or location in Persia, and a brief indication of the habitat of the species.

Of these new records, the most surprising are perhaps those of species previously considered purely European. Less surprising are the Northerly species such as *M. aurinia*, already known from further East. These two categories of Northerly species occur in Persia mostly on peaks or in cool oases in the North. It is also less surprising to discover in Persia the more Southerly species, especially since some of these were already known to occur both to the West and the North-East (e.g. *Agrotis lasserrei* (Pan-Eremic) and *Lithophane lapidea* (Mediterranean)). The discovery of species known previously only from Turkey (e.g. *E. theresiae*) or Turkestan (*L. amoenata*) is also less surprising, though interesting. The discovery in S. Persia, of Middle-East Eremic species such as *C. aurivillii*, was also not unexpected.

ANNOTATED LIST.

RHOPALOCERA.

(*Iphiclides podalirius*, L., ssp. *persica*, Verity. Common in gardens and oases at Tehran and up to 8000 ft. in mountain-oases on the S. side of the Elburz range; also in gardens at Hamadan. Foodplant at Tehran, apparently a wild *Prunus* common in gardens there. Absent from S. Persia, even at heights.

In 1931 Pfeiffer wrote in his Marash Fauna (*Mitt. Muench. Ent. Ges.*, e.V, XXI, Jahrg., Heft II) as follows (my translation):—"The locality Gulheck (Gulhack) mentioned by Verity in this work must be identical with Gulek in the Taurus and cannot be situated in Persia; therefore the race here under consideration must be called *persica*, Vtyj."

Perhaps when Herr Pfeiffer himself visited Tehran in 1936 he realised his mistake, but if he ever published a correction I have not seen it. Gulheck is of course one of a group of villages to the North of Tehran, sometimes collectively referred to as Shrimran; these villages contain the summer gardens and residences of the people of Tehran city, and are situated about 1000 ft. higher, half-way up the long gravel slopes which link Tehran with the more precipitous slopes of To-Chal, the Elburz peak dominating the city. Many records from "Tehran" undoubtedly refer to these villages rather than the city itself.

Pfeiffer's determination of the Marash race of *podalirius* is thus seen to be based on a gratuitous false assumption, though perhaps the Marash race is identical with the Persian. The Turkish name Gulek means "little lake," whereas the Persian "Gulheck" means flowery. Even without a knowledge of these languages, a little more caution might have been observed in a part of the world so full of places with identical names as the Middle East, and the existence of a Persian locality should not have been denied just because its name is, not identical, but, to a foreigner, similar to the name of a place in Turkey!

[*Papilio alexanor*, Esp. ssp. Kuh Barfi and Kuh Bamu, 8000-9000 ft., Shiraz, Fars, one brood in v. At Upper Heights only.]

This species was recorded about 100 years ago from S.W. Persia by Kollar among the 49 species of Lepidoptera taken by Kotschy in 1942 around Shiraz (*Akad. Math.-Nat. Wien Denkschr.*, 1). Since Dr A. Seitz gives for *alexanor* "eastward to E. Persia and Turkestan," perhaps he doubted Kollar's identification or overlooked the record, which the above two records now confirm. Some of Kollar's identifications were certainly doubtful (e.g. *Gonepteryx rhamni*, L., probably should be *farinosa*, Z.), but on the whole that first work on Fars Lepidoptera and geography still holds good, considering its age.]

(*Thais cerysi*, God., ssp. *louristana*, Le C. Ardekan, 4.v, Fars, at 7000 ft. The first rediscovery since the types of the race were caught further North-west along the Zagros. Bare slopes, but not peaks. This appears to be the southernmost locality of this species, whether on the Zagros Range or in Palestine and Transjordan, where the race-form is less aberrant than in S.W. Persia.)

1. *Euchloë cardamines*, L. ssp. To-Chal (S. side of Elburz), 8-10,000 ft., 11.vi. Upper Heights. Pireh-Zan Pass, among oaks, 7000 ft., Fars, 7.iv. Kuh Barfi, Shiraz, Fars, 9000 ft., early v. Upper Heights. The Fars race is larger than the Elburz, otherwise similar.
2. *Satyrus circe*, L., ssp. *asiatica*, Seitz. Hamadan, 6000 ft., early vii. Oasis. The easternmost known locality.
3. *Pararge menava*, Moore ssp. Kuh Alvand, near Hamadan, Central Iran, 9000-11,000 ft. Upper Heights.
4. *Euphydryas aurinia*, L. To-Chal (S. side Elburz) 10,000 ft., 11.vi. Moist ground near spring at Upper Heights, one specimen only.

(*Melitaea arduinna*, Esp. ssp. Lar valley (S. side Elburz), 9000 ft., early vii. A large dull ♀. Shiraz, Fars, 5500 ft., at a spring; a vivid red series. Very local, and not found the next year, despite assiduous search.)

(*Melitaea sarvistana*, Wilts. Described in Wiltshire, 1941a (and illustrated), as a subspecies of *phoebe*, this race is closer to *sibina*, Alph., than *phoebe*, Knoch, and might be a distinct new species.)

(*Melitaea casta*, Koll. There are two easily differentiated races in Persia:—(1) ssp. *wiltshirei*, Higg. Higgins' types were taken on Mt Alvand, near Hamadan, at 7500 and 9000 ft., on 27.vii. The same form occurs on the high mountains near Ardekan, being recorded thence by Brandt under the name "*casta*, Koll.", and taken there myself at 11,000 ft. on 29.vi. It haunts steep screes at Upper Heights. (2) Presumably typical *casta*, Koll. This form, with the underside hindwing less clearly marked and suffused with cinnamon, flies on mountain-tops at 9000 and 10,000 ft. nearer Shiraz.)

(*Melitaea gina*, Higg. This species, which Higgins distinguished from true *didyma*, Ochs., was taken by Brandt above Sineh-Safid, and recorded as "*didyma*." Brandt informed me, *in litt.*, that he took the same species in the Elburz at Nissa, but since he said it was a different race, this Elburz race might be true *didyma*.)

HETEROCERA—ARCTIIDAE.

5. *Ocnogyna loewi*, Z. Kermanshah, W. Persia, c. 5000 ft., 18.xi. The larvae do not hatch at this altitude and latitude until early iii.

Deforested hillside. Sineh Safid, Fars, 6000 ft., 25.xi. A full-grown larva was seen there on 28.iv. Scrub-clad hillside. Pul-i-Fasa and west shores of Salt Lake, near Shiraz, 5000 ft., larvae common in ii. Steppe. Bushire, Fars, S.W. Iran, sea-level, larvae full-grown in late ii. Desert.

6. *Cletis maculosa*, Guen., ssp. *dahurica*, Boisd. To-Chal (S. side Elburz), 10,000 ft., 23.vii. Upper Heights.

LASIOCAMPIDAE.

7. *Chondrostega aurivillii*, Püng. ssp. Bushire, Fars (sea-level), larvae full-grown in ii. Shiraz, Fars, plain and low hills, 5000 ft., larvae full-grown in late iii and early iv. These conspicuous red-and-yellow and velvety black-banded, silky-haired caterpillars are called by the Persians of Fars "Gurbeh-i-No-Rooz" (=Pussies of New Year's Day) (Persian New Year begins March 21st), a most apt name. The race is probably *feisali*, Wilts., but I have been unable to verify this yet, not having obtained the imago, which flies in autumn. I am very familiar with this larva and moth from Iraq, and base my identification for Persia on the larvae. Habitat:—Desert and steppe.
8. *Lasiocampa grandis*, Rog. Khan-i-Zinian, 6000 ft., 20.ix. Salt Lake shores, near Shiraz, 5000 ft., 29.ix. Both localities in Fars; both scrub-clad hills.
9. *Lasiocampa terreni*, H.S. Luristan, 3500 ft., 29.x. Scrub-clad hills.
10. *Taragama siva*, Lef. Bushire, Fars, sea-level. I have seen larvae here feeding on *Zizyphus spina-christi* which I am sure are this species, having found it and bred it on this foodplant at Basra (Iraq). However, Brandt has reported a *Taragama* at Mian-Kotal (4000 ft., Fars) as *repanda*, Hbn., ssp. *alpherakyi*, Chr. *Alpherakyi*, Chr., was already known from N. Iran, being originally described as distinct from *repanda*, a N. African species. *T. siva*, both in its Iraqi and Indian form, differs from *repanda* and *alpherakyi* most noticeably in its whitish hindwings. Since *Zizyphus* also grows at Mian Kotal, perhaps Brandt's record is really *siva*.

DREPANIDAE.

11. *Cilix glaucata*, Scop. Tehran, 5000 ft., 17 and 30.vii; 4.ix. Wild-growing gardens.

SPHINGIDAE.

12. *Deilephila nerii*, L. Tehran and Shiraz (N. Iran and S.W. Iran) gardens, 1.ix and 23 and 24.iv respectively.
13. *Dolbina elegans*, A. B. Haas. Gulhek, Tehran (5000 ft.), a single specimen taken at light on 29.viii in the British Legation garden by Mr Barnett. Evidently rare there. This seems to be the first recapture since the two types described in 1912 from Iskanderun (Alexandretta), Syria.

NOTODONTIDAE.

14. *Notodonta ziczac*, L. ssp. *pallida*, Grnb. Pasqaleh, 7000 ft., near Tehran, larvae found on willows by a mountain stream, 11.vi.39. Imagines hatched 20 and 25.vii.39 and 24.vi.40.

CYMATOPHORIDAE.

15. *Epimicelia theresiae*, Korb. Mt. Alvand, 9-10,000 ft., near Hamadan, 29.vi. Upper Heights.

AEGERIIDAE.

16. *Eusphesia pimplaeformis*, Obthr. Hamadan and Shiraz. Empty pupa cases found protruding from willows or poplars could only be this species, well-known to me from Iraq.

COSSIDAE.

17. *Zeuzera regia*, Stgr. Derband (S. side Elburz, 6000 ft.), near Tehran, 17.vi. Oasis. Hamadan, 7000 ft., 25.vi, 4.vii. Oasis. Pireh-Zan, Fars, 7000 ft., 15.vii. Oak-woods.
18. *Phragmatoecia castaneae*, Hbn. Ahwaz, Khuzistan, S.W. Iran, 250 ft., iv. Desert-oasis.

AGROTIDAE—MELICLEPTRIINAE.

19. *Melicleptria scutosa*, Schiff. Two specimens taken by Mr Barnett in N. Iran in viii, either in Tehran (oasis) or Chalus (forest land, Caspian coast); possibly from both.

AGROTINAE.

20. *Agrotis obesa*, Boisd., ssp. *fusca*, Corti Luristan, 29.x. Scrub woods, Middle Heights.
21. *Agrotis (Powellinia) lasserrei*, Obthr. Shiraz, shores of Salt Lake, x. Also on steppe, 2.xi.
22. *Agrotis (Ogygia) gracilis*, Wagn. (det. Boursin). Kuh Alvand, 7000-7500 ft., near Hamadan, Central Iran. Upper Heights.
23. *Agrotis (Ogygia) orientis*, Alph. Tehran, v-vi. Oasis, 4000 ft. Hamadan, vi. Oasis, 6000 ft. Yezd, Barfkhaneh, vi. 9000 ft., mountain-oasis. Shiraz, Fars, v. 5000 ft., oasis.
24. *Rhyacia xanthographa*, Schiff. Kermanshah, W. Iran, 14.x. Oasis, 5000 ft. Shiraz, Fars, 16.x. Oasis, 5000 ft. Pireh-Zan, Fars, S.W. Iran, ix, x. Oak woods.
25. *Rhyacia palaestinis*, Kalchb. Kermanshah, 20.x. Oasis, 5000 ft.
26. *Triphaena orbona*, Hufn. N. Iran (probably Tehran), viii.
27. *Blepharita trisignata*, Men. Gulhek, Tehran, 5000 ft., larva seen in v in oasis. Kermanshah, W. Persia, 5000 ft., 31.x and 16.xi. Oasis. Luristan, 3500 ft., 29.x. Scrub-woods or oases at Middle Heights.

HADENINAE.

28. *Scotogramma trifolii*, Rott. Tehran, N. Iran, 13.vi. Oasis, 5000 ft. Hamadan, Central Iran, 23.vi. Oasis, 6000 ft.
29. *Polia thalassina*, Rott. Derband, near Tehran, 16.vi. Oasis, 6000 ft. Hamadan, Central Iran, 19.vi. Oasis, 7000 ft.
30. *Xylomania conspicillaris*, L. Derband (S. side Elburz), near Tehran, 6000 ft., 6.iv. Oasis. Sineh Safid, Fars, 6000 ft., to maple bloom, 15.iv; scrub, Upper Middle Heights. This specimen was f. *melaleuca*, View.

31. *Sideridis zaeae*, Dup. Near Ahwaz, Khuzistan, 14.x. Rank riverside vegetation at about 200 ft. (hot desert oasis).

CUCULLIINAE.

32. *Cucullia barthae*, Bours. Lar valley, S. side Elburz, 9000 ft. Larvae found on a dry-growing species of *Scrophularia* on calcareous ground, but not on neighbouring water-figwort in river-meadow, in early vii. Hatched in iv next year. So far only known at Upper Heights in Persia.
33. *Cucullia verbasci*, L. Lar valley, S. side Elburz, 9000 ft. Larva found in vii produced imago next 19.iv. Foodplant: *Verbascum*, growing on calcareous shingle-bed above flood-level in valley.
34. *Cucullia lychnitis*, Ramb. Tehran, 5000 ft. A larva found 24.vi produced adult next 8.v. Kuh Alvand, 7500 ft. (Asadabad pass), near Hamadan. Larvae common on 20.vii on *Verbascum*. Ardekan, Fars, 7000 ft., larvae seen on *Verbascum* at end of vi; apparently its southernmost limit. (Mulleins were searched further south in Fars.)
35. *Ulochlaena hirta*, Hbn. Hamadan, 6000 ft., 11.x and 30.x. Oasis. Kermanshah, common from 15.x to 25.xi. Oasis, but perhaps breeding on unirrigated ground. I presume this species also occurs along the Caspian coast of Persia, since I took a specimen in the Intourist Hotel, Baku (U.S.S.R.), on 8.xi.38.
36. *Aporophyla australis*, Boisd. ssp. Kermanshah, 23 and 28.x.
37. *Lithophane lapidea*, Hbn. At 8000 ft. above Lashkarek (S. side Elburz), larvae were beaten from *Juniperus oxycedrus*, L. I beat the junipers at Upper Heights in the S. Zagros in vain for this species.
38. *Xylina exsoleta*, L. Shiraz gardens, Fars, 5000 ft.; larvae full-grown in iv, adults in xi.
39. *Dryobotodes protea*, Esp., ssp. *incolorata*, Warr. Chihar Zibar Pass, near Kermanshah, H. Iran, 6.xi, 6000 ft. Oak scrub. Pireh-Zan, Fars, S.W. Iran, 20.x, 7000 ft. Oak woods.
40. *Antitype serpentina*, Tr. Shiraz Salt Lake, 29.x, 5000 ft. Steppe (Fars, S.W. Iran). Shapur, Fars, 20.xi. River-gorge, with scrub-clad sides.
41. *Cosmia ocellaris*, Bork., f. *palleago*, Hbn. Isfahan, Central Iran, 6000 ft., xi (f. *palleago*, Hbn., and a more orange form). Shiraz, S.W. Iran, 5000 ft., xii.

ACRONYCTINAE.

42. *Simyra dentinosa*, Frey. Barfkhaneh, near Yezd, Central Iran, 5.vi. Upper Heights, 11,000 ft. Pireh-Zan, Fars, S.W. Iran, 7.iv. Oak woods.

ZENOBIIINAE.

43. *Mania maura*, L. Shiraz, S.W. Iran, 6.vi. Oasis, 5000 ft.
44. *Parastichtis rurea*, F. Gulhek, Tehran, 13.v, 5000 ft. Oasis.
45. *Stilbina hypaenides*, Stgr. Luristan, 3000 ft., 29.x. Semi-deforested woodland. Shapur, S.W. Iran, 3000 ft., 19.xi. Intermediate biotope between oak scrub zone and plain with *Zizyphus* and date-palms.

46. *Phragmitiphila typhae*, Thnbg. Shiraz, S.W. Iran, 5500 ft., 12.vi to 15.viii. Marshy stream.
47. *Arenostola sohn-retheli*, Püngl. Shiraz, 5500 ft., 19.vi. Marshy stream.
48. *Archanaera algae*, Esp. (*cannae*, O.), ssp. Shiraz, 5500 ft., 12-19.vi. A rather constant, rosy race, with pale hindwings.
49. *Porphyrinia conistrotata*, Hamps., and
50. *Porphyrinia supuncta*, Stgr. Both at Hamadan, Central Iran, 20.vii. 7000 ft., mountainside with stream.

EUTELIANAE.

51. *Eutelia adoratrix*, Stgr. Derband, near Tehran, 6000 ft., oasis, 13.vi and 10.viii.

CATOCALINAE.

52. *Anua tirhaea*, C. Kuh Sivand, Fars, S.W. Iran, 8000 ft. Larvae seen on *Pistacia*, Upper Heights (wooded).

PHYTOMETRINAE.

53. *Phytometra deaurata*, Esp. Hamadan, Central Iran, 7000 ft., 1.viii. Oasis.
54. *Phytometra chrysitis*, L. Tehran, N. Iran, 5000 ft., 9.viii. Oasis (ab. *disjuncta*, Schultz).

HYPENINAE.

55. *Syneda herzi*, Alph. Derband, near Tehran, 6000 ft., 16.vi. Oasis.
56. *Hypena munitalis*, Mann. Lar valley, vii, 9000 ft. Upper Heights.

GEOMETRIDAE—OENOCRROMINAE.

57. *Aplasta ononaria*, Fuessl. Kuh-i-Chavireh Shah, 7000 ft.; Luristan, Upper Middle Heights; 12.vi.
58. *Orthostixis cribraria*, Hbn., ssp. *amanensis*, Wehrli. Chalus woods, Mazanderan, N. Persia, 10.viii (leg. Barnett). Sea-level, forest-clad shores of Caspian.

STERRHINAE.

59. *Sterrha consanguinaria*, Boisd. Gulhek, Tehran, N. Iran, 16.vi. Oasis. Hamadan, Central Iran, 6000 ft., 19 and 25.vi. Oasis (det. Prout). Kuh-i-Chavireh Shah, 7000 ft.; Luristan, W. Iran, 12.vi. Upper Middle Heights (det. Prout).
60. *Sterrha trigeminata*, Haw., ssp. Gulhek, Tehran, 5000 ft., 15.viii. Oasis

LARENTIINAE.

61. *Lithostege amoenata*, Christ. (det. Prout). Kuh Alvand, Hamadan, Central Iran, 29.vi, 9000 ft. Upper Heights.
62. *Xanthorhoe fluctuata*, L. Hamadan, 6000 ft., 4.vii. Oasis. Khorramabad, Luristan, W. Iran, 4000 ft., 3.iv. Deforested Middle Heights with gardens (oasis).
63. *Xanthorhoe designata*, Hufn. Gulhek, Tehran, 5000 ft., 15.vi. Oasis.

GEOMETRINAE.

64. *Ennomos fuscantaria*, Steph. Derband, near Tehran, N. Iran, 6000 ft., 16.viii. Oasis. Gulhek, Tehran, 5000 ft., 25.vi. Oasis (ab. *effuscaria*, Reb.).
65. *Ennomos erosaria*, Schiff. Shiraz, S.W. Iran, 5000 ft., 25.vii. Oasis.
66. *Colotois pennaria*, L. Gulhek, Tehran, 5000 ft. Oasis. Larvae mature in v.
67. *Dasycorsa modesta*, Stgr. Khorramabad, Luristan, 4000 ft. Deforested Middle Heights.
68. *Eilicrinia trinotata*, Metzn. Gulhek, Tehran, N. Iran, 5000 ft., v, vi, vii, viii. Oasis. The grey typical form in v; the yellow f. *aestiva*, Reb., from vi onwards.
69. *Zamacra flabellaria*, Heeg. Bushire, Fars, sea-level. Found dead in spider's web in ii. Hot desert (maritime), with a few gardens. Persian Gulf.
70. *Gnopharmia irakensis*, Wehrli. Kuh Alvand, near Hamadan, 9000 ft., 20.vii. Upper Heights (det. Wehrli). I have similar specimens from many Iranian localities but their genitalia have not yet been examined.

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A FURTHER EXTENSION OF THE RANGE OF MYRMICA SCHENKI, EMERY.

By FERGUS J. O'ROURKE, F.R.E.S.

D. P. Walls (6) recently recorded the occurrence of the rare ant *Myrmica schenki*, Emery, at Portmarnock, Co. Dublin. This species, which is found locally throughout the Palaearctic and Nearctic regions north of 40° North Latitude, had previously been recorded from only four stations in these islands; of these, three are located in Ireland—viz., Maherabeg, Co. Wicklow (4), Kilcarr Bridge and by the River Slaney near Kildavin, Co. Carlow (5)—the fourth station, the only British one, is at Sully, Glamorgan (1). Another hitherto unrecorded station is in the demesne at Glengarriff, West Cork, where A. W. Stelfox, to whom I am indebted for permission to publish it, swept a female in July 1935. Thus all the stations in this country occurred in the South and East, it was therefore of interest to find that the ant occurred also in the West of Ireland at Roundstone, Co. Galway, which is the most westerly record for Europe (9° 50' W. long.) and also together with the Portmarnock one appears to be the most northerly (I have however been unable to check some references). In 1944 on 14th July at Roundstone I found a worker *schenki* foraging on the surface of a narrow road, but despite a careful search the location of the nest could not be found. I was greatly surprised when a few minutes later my brother Angus handed me another worker of this species picked up running about among worker *Formica fusca*, L., on bare rock in damp peaty ground some 200 yards away. A search here also failed to locate the nest. Thenceforth a careful search was made for nests in the area around Roundstone and later some workers were seen foraging at an altitude of 200 feet on Errisbeg Mountain. A diligent search revealed a nest about 100 yards away. It is of course extremely unlikely that the workers seen came from this nest for the maximum foraging distance for the allied species *Myrmica scabrinodis*, Nyl., is 20 feet, giving a feeding territory of 140 square yards [W. Pickles (2)]; were the foraging distance 100 yards the feeding territory would exceed 7 acres, which seems hardly likely since the population would not be more than three or four thousand (2).

The nest was quite different from that at Portmarnock which Mr Walls kindly showed me on 3rd September 1942, and which fitted the

description of those at Kildavin and at Sully. The colonies in the latter locality were described as being "all situated in the slope of a small bank and not under stones . . . the entrance being a small round hole, much as is made by the smaller bees (*Halictus*, etc.)." The Roundstone nest was beneath a flat stone bedded in moist peaty soil and under which there was also a colony of *Acanthomyops* (*Chtonolasius*) *flavus*, F., whose members attacked the *schenki* when I lifted the stone. Present in the nest were numbers of workers and larvae of all sizes as well as some worker pupae. No queen was seen nor were there any winged forms although most *Myrmica* colonies in the neighbourhood had numbers of them on that date. A specimen has been donated to the National Museum in Dublin.

Some weeks later on 4th August, at Lough Ine, West Cork, some 15 miles from Glengarriff, I picked a winged female of this species off Professor L. P. Renouf's arm. This specimen was taking part in the "swarming" of ants which took place on several different days in that locality, for during the previous days a number of flights of various ants were seen. This represents the first published swarming date for the species in these islands. [A. W. Stelfox, however, took males and winged females at the entrance to a subterranean nest at Kildavin on 9th August 1929 (5)] Another female was taken flying in the same area on 15th August. Despite a vigorous search no nests were found but workers were found at the water's edge at the point marked S15 on Professor Renouf's Map III (3). It is hoped to revisit both localities this season.

See *British Ants*, 1927, 2nd Edition, pp. 150-152.

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IRISH LEPIDOPTERA COLLECTING IN 1944.

By BRYAN P. BEIRNE, Ph.D., M.R.I.A., F.R.E.S.

(Concluded from p. 66.)

**Eupithecia tripunctaria*, *Hemimene petiverella*, *Borkhausenia fuscens*, and a melanic form of *Argyroploce lacunana* occurred in the fields at Finglas, Co. Dublin, on 29th July. Near Ballybrack on the evening of the same day *Ancyliis badiana*, *Argyresthia goedartella*, *Zelleria hepariella* and *Tischeria marginea* were taken. On the evening of

30th July a further visit was made to the disused railway-bed near Killiney. Here a species of *Eupista* occurred which could not be identified either from the external characters or the genitalia. Other species were *Pararge aegeria*, *Procus furuncula*, *Peronea aspersana*, *Eucosma cana*, *Ancylis badiana*, *Bryotropha desertella*, *Brachmia rufescens*, *Blastobasis lignea*, *Eupista discordella* and **E. galactaula*. *Crambus culmellus*, *C. hortuellus*, *Peronea holmiana*, *Spilonota ocellana*, **Endothenia oblongana*, *Blastobasis lignea*, *Eupista galactaula*, *Lithocolletis messaniella*, *L. quercifoliella*, and *L. spinicolella* (the second Irish record) occurred at Foxrock on the evening of 1st August. The occurrence of *messaniella* and *quercifoliella* is curious as there is no oak of any sort nearby. The occurrence of *B. lignea* supports the view that the species feeds on *Juncus*. There are no conifers at the localities in Killiney, Foxrock, Kilmacanogue Marsh and Howth, where the species was taken commonly, but *Juncus* is abundant in the first three localities and at Howth the species was found resting on Gorse on the cliffs. It seems likely that the species is polyphagous, and perhaps feeds on dead leaves and seeds of all types. Meyrick states that it feeds on dead leaf-refuse, Mr A. E. Wright has bred it from conifers, and I have bred it from the heads of *Juncus*. It seems to be more common in Ireland than in England, and was taken in Antrim in 1902 and in Wicklow in 1911, but was not found in England until 1917.

On 3rd August the weather started off fine and sunny but later a cold mist appeared, after which few Lepidoptera could be found. The area worked was a marshy valley at Kilruddery, Co. Wicklow, behind Bray Head. Species taken included *Sterrrha biselata*, *Xanthorhoë designata*, *Plemyria bicolorata*, *Epirrhoë alternata*, *Aphomia sociella*, *Crambus geniculeus*, *Ditula angustiorana*, *Tortrix loeflingiana*, *Cnephasia virgaureana*, *Argyrotoxa conwayana*, *Peronea latifasciana*, *Eucosma penkleri*, *Bactra lanceolana*, *Platodora cytisella*, *Telphusa humeralis*, **Mompha locupletella*, *Blastobasis lignea* (amongst Larch), *Argyresthia brockeella*, *A. goedartella*, *Eupista lutipennella*, *Ochsenheimeria birdella* (*bisontella*), *Prays curtisellus* (fuscous form), *Lithocolletis quercifoliella*, *Tinea cloacella* and *Nepticula aurella*. *Argynnis paphia* was just out, judging from its appearance, although it was well out more than a fortnight earlier at Tipperary. The Quill, a small wood above Kilmacanogue, Co. Wicklow, was visited on 5th August. This formerly excellent locality is now almost completely destroyed. All the large oaks and birches have been cut and the formerly rich ground vegetation has become overgrown with Bracken. Matters were not helped by the presence of a number of goats. The day was sunny but there was a strong gusty wind, and only common species were taken. These included *Sarrothripus revayana*, *Sterrrha aversata*, *Crambus tristellus*, *Peronea emargana* (*caudana*), *Eucosma ramella*, *Paltodora cytisella*, *Chelaria* (*Hypatima*) *conscriptella*, *Zelleria hepariella* (yellow form), *Eupista fuscadinella* and *Lithocolletis cramerella*. The wind had dropped by the evening and some interesting species were taken at Kilmacanogue marsh, but later a cold mist appeared, after which nothing could be found flying. **Mompha propinquella*, previously recorded only from Kerry, and **Aristotelia umbriferella* (*atrella*) were the most important captures. Other species included *Ancylis badiana*, *Blastobasis lignea*, *Borkhausenia fuscescens*, *Eupista galactaula*, *E. glaucicolella*, *Prays curtisellus* (fuscous form),

Cataplectica auroguttella (not recorded from Wicklow since 1855) and *Tinea cloacella*.

The North Bull Island, an extensive area of sand-dunes on the north side of Dublin Bay was visited on 8th August. The day was sunny and windy but a number of species were taken at the eastern tip of the Island, the western end being occupied by a large proportion of the population of Dublin. *Satyrus semele* and *Zygaena filipendulae* were abundant and several female *Lasiocampa quercus* were seen. *Argynnis aglaia*, *Heodes phlaeas*, *Polyommatus icarus* and *Euxoa tritici* were common on Ragwort. *Actebia praecox* is known to occur there, but no specimens were found. However *Epirrhoë galiata*, *Crambus perlellus*, *C. geniculeus*, *C. tristellus*, *Phthorimaea marmorea* and *Bryotropha desertella* were common on the sandhills. On the golf course *Cnephasia conspersana* and a small and brightly-marked form of *Enarmonia succedana*, evidently not feeding on Gorse, occurred. The following day larvae and pupae of *Callimorpha jacobaeae* were found in great abundance on the sandhills at Portmarnock, Co. Dublin. *Spilonota incarnatana* and *Argyroploce rosaceana* were common in the hollows of the sand-dunes. There are only two previous Irish records for the latter species. A curious capture was *Leucoptera laburnella*, as there is no Laburnum for miles. The identification was confirmed by examination of the genitalia. Other species taken were *Euxoa tritici*, *Apamea secalis* and *Hydroecia nictitans*, on Ragwort, and *Crambus geniculeus*, *Eucosma cruciana*, *Argyroploce cespitana*, *Bryotropha desertella*, *Phthorimaea marmorea* and *Acompsia cinerella*.

On 12th August a visit was paid to Newcastle Strand, Co. Wicklow. The vegetation had suffered from fires started by sparks from the passing trains but Lepidoptera were common. Two **Bucculatrix cristatella* were taken, the first Irish record for the species. Other species were *Satyrus semele*, *Maniola jurtina*, *Euxoa tritici*, *Hydroecia crinaniensis*, *Crambus tristellus*, *Pyrausta purpuralis*, **Hemimeme petiverella*, **Bryotropha desertella*, **Eupista discordella*, *Elachista atrifrontella* and *Plutella maculipennis*. Lepidoptera were very common in Newcastle Marsh, the species taken including *Leucania impura*, *Epione repandaria*, *Epirrhoë alternata*, *Crambus geniculeus*, *Peronea emargana*, *Eucosma ramella*, *E. nisella*, *E. penkleriana*, *Bactra lanceolana*, *Endothenia oblongana*, *Pammene populana*, *Enarmonia succedana*, *Batrachedra praeangusta*, *Carcina quercana*, *Glyphipterix cramerella*, *Argyresthia goedartella*, *A. albistria*, *Lithocolletis alnifoliella* and *Tischeria marginea*.

No species new to the locality were found at Foxrock on 7th August, but near Ballybrack on 14th August *Eilema lurideola*, *Cilix glaucata*, *Argyresthia nitidella*, *Caloptilia tringipennella* and **Lithocolletis alnifoliella* occurred. Little was taken on the south cliffs of Howth on 15th August, owing to the high wind. The species noted were *Satyrus semele*, *Anaitis plagiata*, *Epirrhoë galiata*, *Zygaena filipendulae*, *Enarmonia succedana*, *Blastobasis lignea* and a species of *Eupista*, probably *therinella*, a species not previously recorded from Ireland. There was still a wind on the following day when a visit was paid to the Glen of the Downs, Co. Wicklow. The only interesting species taken was **Lithocolletis spartifoliella*, previously recorded only from Kerry and Tyrone. A feature of the locality was the enormous numbers of Neuroptera and Syrphidae on the oaks. Other Lepidoptera noted were *Triphaena comes*,

T. janthina, *Oidaematophorus monodactylus*, *Nomophila noctuella*, *Pandemis corylana*, *Eucosma ramella*, *Telphusa humeralis*, *Elachista magnificella*, *Zelleria hepariella*, *Lithocolletis quercifoliella*, *Ypsolophus radiatella*, *Gelechia mulinella* and *Acrolepia granitella*. **Lithocolletis scopariella* was taken at Ballybetagh Bog, Co. Dublin, on 26th August. This is the second Irish record, but the locality in which I took it previously is only a mile or two away. Owing to the high wind *Heodes phlaeas*, *Arenostola pygmina*, *Epirrhoë alternata* and *Eucosma penkleriana* were the only other Lepidoptera found.

Several *Epunda lichenea* came to light at Seapoint, Co. Dublin, in September, and *Teichobia filicivora* was common in the same locality during the summer. A specimen of **Daphnis nerii* found at Sandymount, Dublin, was brought to me. This is the first Irish record for the species.

Owing to the severe cold spell early in 1945 it seems probable that the summer of 1945 will be a good season for Lepidoptera, certainly better than 1944 and perhaps very good. There were severe cold spells in the winters of 1878-9, 1880-1, 1894-5, 1916-7, 1928-9, and 1939-40 and, except in 1929, Lepidoptera were far more numerous in the following as compared with the previous seasons, judging from the published records, and sometimes, as in 1917 and 1918 and in 1940, were very abundant.

Dept. of Zoology, Trinity College, Dublin, 26th March 1945.

COLLECTING NOTES.

SPRING EMERGENCE OF *A. ATROPOS*.—A specimen of this species was brought to the Museum here on 16th May, found the previous evening. It was dead but not yet stiff. The occurrence, though known, seems sufficiently unusual to be worth publishing.—(Rev.) GEORGE WHEELER, Worthing.

WIDE RANGE ABROAD OF *BREVILINEA*, FENN.—Once we Norfolk men thought we had a real endemic in *Arenostola brevilinea*, Fenn. Then we had to admit it also inhabited neighbouring parts of Europe. Now it seems to afford a parallel to that other Norfolk "speciality" which I recently found in S.W. Iran, *Archanara algae*, Esp. (= *cannae*). In an article in the *Revue Française d'Entomologie*, Tome X, Fasc. 3-4, April 1944, Charles Boursin not only records *Arenostola brevilinea*, Fenn., from Northern Daghestan (Caucasus), but states that the species *impudica*, Stgr., is nought but a blackish race of this species; and he proves his point with photographs of the genitalia of a Norfolk and an Amur specimen. The Caucasus specimen belongs, however, to the European, rather than the Asiatic, race.—E. P. WILTSHIRE, One Fifth Avenue, New York 3, U.S.A.

SUBSTITUTE FOODPLANTS (VERBASCUM GROUP).—In my article with this title (*Ent. Rec.*, LV, September 1943), I gave *Verbascum* and *Scrophularia* as a group of plant genera preferred by certain oligophagous lepidopterous larvae. It is now interesting to know that a third genus can be added to this group, namely *Celsia*, L. This genus is also in the Scrophulariaceae and indeed is placed next to *Verbascum*, so there

is nothing really surprising in the discovery for which we are indebted to the famous entomologist resident in Morocco, Mr H. Powell. Full details will be found in Charles Boursin's "Contributions a l'Etude des Agrotidae—Trifinae, XXVII:—Nouveaux Agrotidae Palearctiques" in the *Memoires du Museum National d'Hist. Naturelle*, Paris, 1940, Tome XIII, Fasc. 4. The larvae discovered by Mr Powell at Sidi Slimane, Morocco, were feeding on a *Celsia* in a state of nature, but in captivity ate *Scrophularia sambucifolia*, completing their growth on it. From them hatched the types of *Cucullia celsiphaga*, Bours.—E. P. WILTSHIRE, One Fifth Avenue, New York 3, U.S.A.

SEASONAL NOTES (EARLY 1945) IN DORSET.—Following my note on Dorset butterflies in 1944 (*E.R.*, p. 21, February 1945), as this is an abnormal season I append a short note on some of the emergencies in this district up to the end of May.

G. rhamni ♂ was first seen on the wing on the 24th February, and both *urticae* and *io* in early March. A solitary *P. rapae* was seen on 7th April, but I am unable to give a date for *P. napi* as I was breeding a large number and released unwanted specimens a week or so before any were seen elsewhere in the neighbourhood. *P. aegeria* ♂♂ were well out on the 8th April, followed by *cardamines* ♂♀ on the 10th April. On 19th April a solitary ♂ *argiolus* was seen and several *V. atalanta* were flying in the sunny lanes. On 23rd April three *phlaeas* were seen, to be followed in early May by a very strong batch. On the night of 30th April—1st May, there was a disastrous frost and all butterflies disappeared for several days, but later the hatch of *E. aurinia* did not seem to have been affected. On the 13th May I made a visit to Holcombe Wood and found *E. aurinia* well on the wing. *P. icarus*, *A. agestis* and *C. pamphilus* were all flying in good strength and *cardui* were everywhere, a number being seen. On 15th April *euphrosyne* was on the wing at Hill Wood, being followed at this locality by *selene*, *rubi* and *sylvanus* (*venata*) ♂♀ on the 24th. On 21st May one ♂ *bellargus* was seen where I made a fruitless excursion to a wood, not two years previously, in search of *euphrosyne*. On the whole in spite of the cold spell at the end of April the season was some ten days early as compared with recent years in this district.—ROBERT D. R. TROUPE.

NOTE ON EUPHYDRYAS AURINIA.—Having bred *aurinia* in the spring of 1944 I mated two pairs and carried one nest safely through the winter. There were nearly 200 larvae in the early year and most of these pupated but a number failed to hatch. However, I succeeded in hatching a ♀ almost identical with the specimen shown as fig. 22, plt. 20, in Frohawk's *Natural History of British Butterflies*, and a ♂ still more extreme with no spotting at all on the under hindwing, the upper surface being considerably melanic. I mated the ♀ to an ordinary ♂ from the same batch and hope for further abs. next season.—ROBERT D. R. TROUPE.

A QUERY.—I have recently come across a feature in several Lepidoptera which I have hatched. It is a collection of liquid between the two layers of skin on the wings, like a blister. Sometimes this occurs on the fore and sometimes on the hindwings. This has either to be let out by puncturing and soaking up with blotting-paper or set without puncturing when the wing generally dries with a crumpled appearance.

I would be interested to know if this is a common occurrence, or whether it is due to some fault in the hatching conditions. Some of those affected (*L. filipendulae*) were hatched from wild cocoons placed in a muslin-covered box in a fairly warm living room, while others were hatched (*E. satellitia* and *T. incerta*) in a wire gauze cage in a cool cellar from bred pupae.

If you have any information at your disposal which might throw light on this trouble I would be very interested to hear of it as it might help in future breeding.—ALAN M. MACLAURIN, Suilvenbeg, Kilmacolm.

OBSERVATIONS ON SATURNIA PAVONIA, LINN.—Referring to my notes on this species in *Entom. Rec.*, Vol. liv, p. 87, I see a note in *Entom.*, lxxvii, p. 130, that the flight was always down, or slightly across wind, with the query, When does the return flight take place? The answer is, of course, as I observed then, and have since, that the flight is to and fro, and in all directions, and you often see two crossing each other in opposite directions. This, I may add, was never given.—(Capt.) A. F. L. BACON, Burghclere, Hants (N.), 24th March 1945.

OCCURRENCE OF ODONTOMYIA ARGENTATA, FABR. (DIPT.-STRATIOMYIDAE) IN BEDFORDSHIRE AND NORTH HERTS.—On 1st May 1943 I caught a solitary male of this species basking in the sun on a grassy path at Oughton Head, near Hitchin, a well-known collecting ground to local enthusiasts. The whole area is very marshy and the river is stagnant in places, where willows and reeds grow in the water. A photograph of this locality is given in the "Natural History of the Hitchin Region," 1934, p. 78.

In 1944 I caught several males, on the 24th and 26th April, in the sandpit referred to in my note on *Acrydium subdatum* (ante p. 106, 1944), and saw several flying about here later in May. The sexes differ in colour, the male having a silvery pubescence and the female a golden pubescence on the abdomen. So far I have not caught or seen a female of this species.

Odontomyia argentata is a rather local and uncommon insect, but as Verrall suggests (*Brit. Flies*, Vol. v (1909)), it may be overlooked by collectors, most of whom start later in the season. Mr J. E. Collin (who kindly identified the specimens for me) says that he has knowledge of it being recorded in most of the eastern counties and also in Sussex, Hampshire, Dorsetshire, Wiltshire, and Oxfordshire.—B. R. LAURENCE, 31 Sherwood Road, Luton, Beds.

CURRENT NOTE.

AMERICAN ENTOMOLOGISTS AND THE WAR.—For the following particulars of the activities of American entomologists in the war I am indebted to my old friend, Mr J. A. G. Rehn, Curator of Insects of the Academy of Natural Sciences, Philadelphia.

Roberts, of the staff of the Academy, who has done good work on the internal genitalia of the Acridids, is a lieutenant in the Sanitary Corps

in Malaria Survey. Dr Helwig, Assistant Professor in Cytology and Genetics at the University of Pennsylvania, is in the same unit, which is a stroke of luck for both, as they are great friends. Dr Helwig is a voluntary part-time worker in the Academy. Another voluntary worker in the Academy, by name Cadbury, came to England on civilian relief at the beginning of the war; while with us, not inappropriately, he married a Miss Rowntree.

Mr Rehn's son, John Rehn, had been engaged on teaching work on Medical Entomology and Parasitology at Cornell University; he has since gone overseas as Senior Entomologist on a large Transport and Bomber Base. After some service overseas he was appointed lieutenant in the Army Sanitary Corps attached to a Malaria Survey unit, where he spent much time training recruits. From his service overseas he came back with some valuable practical and scientific experience, and he did not forget the grasshoppers.

Gurney, the Academy's orthopterist, has been in the Pacific with the rank of Captain, in charge of a Malaria Survey. Tinkham is also a Sanitary Corps officer.

My friend continues: "Our entomologists are almost entirely being poured in to fight disease; malaria, yellow fever, dengue, and a thousand and one other things, and men are not being exempted for purely agricultural control work to-day; there are *virtually no exceptions*. . . . We are first and foremost throwing every available younger entomologist into saving the lives of Allied soldiers by keeping down insect-borne disease. With the entomologists go the parasitologists and Sanitary engineers. . . ."

Further: "The American Entomological Society has completed three really important war-time auxiliary tasks. These were Mosquito Atlases I-II, the first made up of the more important malaria vectors of the New World, the second the same of the Old World. Each species was treated on a single sheet, with the more important structural characters of the adult figured on one side, with a summary in text below, and on the other page structural features of the larvae, with habitat, notes and distribution below, the whole with three punch-holes, so that the sheets can be cut apart and used in a loose-leaf folder if desired; they are printed on an 80-pound Ledger paper stock for strength and durability.

"The other, by three authors, one of whom is Colonel Russell, Chief Malaria Control Officer of the U.S. Army, is a key to the identification of adults and larvae of all known Anophelines, with references, type localities, figure references, distribution, general habits and known relation to malaria for each.

"All had to be driven through the press at high speed. . . . All the illustrations are new and made by the Army just for this work. Of the authors of the atlases, one was from the Academy, the other two from the California Academy of Sciences, both in the Army now; of the key the other two authors were Dr Roseboom, head of the Department of Public Health at John Hopkins University, Baltimore, and Dr Alan Stone, the U.S. Dept. of Agriculture's mosquito man."

I received this letter about 18 months ago, but pressure of work has prevented me forwarding this interesting news sooner. Some of it may be out of date by now.—M. BURR.

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ler's British Larvae ('86-'01). For disposal, "Entomologist's Record," com-
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Communications promised.—T. B. Fletcher, Dr E. A. Cockayne, J. E. Collin, H. Donisthorpe, Dr Malcolm Burr, Wm. Fassnidge, H. A. Leeds, Prof. J. W. Harrison, Hy. J. Turner, P. Sivilier Smith, T. Greer, E. P. Wiltshire, A. W. Adams, B. R. Laurence, Com. G. W. Harper, Alan M. MacLaurin, Capt. A. F. L. Bacon.

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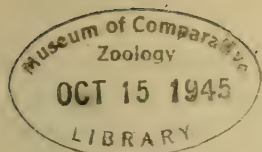
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HONEY-DEW.

By AN OLD MOTH-HUNTER.

13820

Leporina the Miller is a pleasing insect to rear. I find the full-grown larva, occasionally, curled up asleep on the underside of a birch leaf, a grass-green larva with long white silky hair, reminding one of a green Persian cat—or, as some say, an Angora rabbit. And I have found the moth at rest on an elderly birch, a striking testimony to the advantage of procrystis. But I never find more than two or three, four at most, larvae in a year, no matter how industriously I search. Tutt recorded that the eggs of this moth, though laid separately, "are usually placed to the number of a score or thereabouts, in close proximity; consequently, when young, the larvae are usually to be found, several near together, on adjacent leaves or branches, so that one being found, others should be searched for" (*Practical Hints*, I, 47). This has never been my experience, probably because I have never lived in a locality where *Leporina* was common. A correspondent tells me that in the 'nineties, in north Hampshire, one could always find as many as one wanted in an hour or so "on the young trees in newly-made roads." Perhaps some day I may live in some such place—and then, I suppose, *Leporina*'s charm for me will vanish.

If you have but a nodding acquaintance with the species it is worth while searching for the infant larvae early in July. In the first instar he follows the family rule of having some of his somites brown and some of his somites white. His head is black; his prothorax pale; mesothorax white; metathorax and first abdominal somite burnt Siena (or yellow-umber, whichever you prefer); 6th and 7th white; and the rest of his anatomy the yellow named after some conflagration which happened in the archiepiscopal see of Tuscany. So that when you see him curled up on the underside of a leaf, head to tail in the usual *Acronycta* way, you cannot possibly mistake him for anything but what he is; for of all the birch-eaters only the *Apatele* genus have some of their somites white and some of their somites Siena in the first instar.

In 1944 I found four young larvae, and they all died at the end of their second stadium. This puzzled me for some time and even now I don't know what caused their demise; but I thought for a time it was honey-dew. For this reason. I found the first one right under a seven-foot birch bush on a hillside. Evidently the parent moth had flown under the bush and laid an egg, perhaps two, on the underside of a leaf on a twig within six inches of the ground and within the same distance of the main stem. I have found young larvae on several occasions before this; but always about three feet from the ground, or halfway up a smaller bush, usually I think on the east or west sides and not very near the extremity of a branch.

A day or two later I revisited the spot, and sitting down beside an adjacent bush I stuck my head among the lowest branches, turned over the leaves near the main stem, close to the ground, and found two more larvae, both in the first stadium. Next day I found the fourth, on the same hillside and in an exactly similar situation.

That year (1944) was the worst for green fly that ever I remember. Beating was so unpleasant that I gave it up: dense clouds of aphides arose from every bush, from every branch, and settled on my face and in

my ears and nose, and crawled about behind my spectacles. At every whack the beating-tray was carpeted with green fly. Day after day, week after week, month after month, every leaf on every birch bush shone from afar as though after a heavy rainstorm. Every twig was sticky to the touch.

I reared broods of *D. trimacula* (*dodonaea*) and *D. ruficornis* (*chaonia*) that year, and having read somewhere—I think it was in a book called *Talking of Moths*—that honey-dew was harmful to them I decided that this was a good opportunity to put the matter to the proof. So in each stadium of each species I gave some of my larvae leaves coated with honey-dew. They ate the leaves as usual and displayed the utmost non-chalance. Not a single larva died nor even suffered, so far as I could see, from a stomach-ache, and after the second moult I did not lose one of these pioneers. Why several of them died in infancy I do not know; but then, I very much doubt whether anybody ever has reared every single larva of a brood hatching from eggs laid by either of these species. Deaths occur from reasons unknown to us, though we hold the most exhaustive of inquests. Perhaps some die because they have received injury during a fight in the dark, as must sometimes happen when we keep a number of larvae together in one receptacle. Maybe the result of eating a tough piece of stale leaf caused constipation—for in hot weather a percentage of the juices of a sprig evaporate before the state of the foliage warns us to give fresh food at once. There are changes and chances in the mortal life of a caterpillar which not even the most skilled rearer can avoid. But I was unable to attribute any death to honey-dew because all the deaths were sudden and occurred either some days after the last meal of honey-dew or else in those larvae which had never had any honey-dew at all.

At the same time I was rearing a brood of *N. anceps* (*trepida*). Having found a year or two previously that sticky leaves were *not* harmful to this species I took no precautions with them; but this cannot be advanced as evidence one way or the other because, knowing that rain-water is essential to this species, I swished their food under the rain-water tap till it was thoroughly wet ere ever I put it in their cages. Thus doubtless most of the honey-dew was washed off. Four of these *anceps* died in their fourth stadium from a cause that I could not determine but suspect to have been that loathsome small Tachinid which glues its microscopic eggs to the very edge of a leaf, so that wash you the leaf never so carefully it is odds on that the eggs will remain *in situ* and that one of your larvae will, presently, eat them. The eggs hatch in the larva's intestine, through which the grubs bore and slowly eat their way towards the head. No wonder the larva begins to "do" badly, then grows less in stature, finally assumes a yellow tinge, and dies a flabby piece of shrunken skin. There is no cure and even by wetting the leaves and running their edges between the nails of your finger and thumb you cannot be certain; it is a risk that the lepidopterist has to take when rearing *anceps*—and many another species too. At the time I was unable to lay the deaths of my four *anceps* at this parasite's door because I was in a temporary abode and bereft of microscope and dissecting tools. But I did not wash the birch leaves upon which I fed my young *Leporina*; for I am still partly sceptical about the supposed baneful effects of honey-dew. In fact, I believe that this

form of carbohydrate, *in moderation*, is necessary to the larvae of many species which feed on broad-leaved forest trees, and Allan (*Talking of Moths*) relates that on one occasion he "pulled round" a weakly young *anceps* by washing its food with sugar-water. *Post hoc, ergo propter hoc?* Possibly; yet *P. populi* noticeably grows faster if his foodplant is anointed with sugar-water and this is easy to prove simply by dividing a brood into halves and denying one half the sweet course. After all, there is honey-dew on the leaves of forest trees every year, so a larva that cannot stomach it had better choose some other foodplant.

Had I found my four young *Leporina* on leaves fringing the bush a foot or two from the ground this matter of honey-dew would not have occurred to me; but unless it be the custom of *Leporina* to lay her eggs low down underneath a bush there must have been some reason why a certain moth—or four moths for aught I know—departed from custom in this particular place in that particular year. On the leaves inside and under the bush where the eggs were laid there was no honey-dew. Did the moth, or moths, oviposit there a-purpose and was honey-dew the stimulus that prompted the moth's selective action?

I should find it difficult to believe that. The honey-dew problem (if it be a problem) occurs only once in so many generations. Do you suggest that the moth knew (had cognition) that *excess* of honey-dew on the opposite side of the leaf to the one on which she proposed to lay her eggs was, somehow, bad for the race?

If you believe that, you are ahead of me by some distance. You may be right, but you are going further along the road than I am prepared, at present, to follow you. There is no man living who is more interested in biopsychology than I am; but I am a born sceptic and I instinctively cast about me for every possible reason other than a psychological one when faced with a problem such as this. I will accept an explanation of an incident of larval behaviour which demands the introduction of psychology only after I have tested, and discarded as worthless, every other possible solution, chemical, physical, physiological.

So I think the moth or moths who gave rise to my *Leporina* flew under the bush because it was a stormy night, and finding it a convenient sheltered spot which emitted an aroma of birch they laid their eggs there in comfort . . .

But I don't yet know why my four *Leporina* died.

I cannot help feeling that the case against honey-dew has not yet been made out. In excess it *may* be harmful to certain larvae in certain stadia; but until proper physiological work on the subject has been done I suggest that our verdict should be "not proven." In a letter to me in 1944 a most successful and experienced rearer of Lepidoptera wrote: "In 1911 I had a brood of *Lithomoia solidaginis* which fed up nicely on birch till the last stadium; in fact, till nearly full-grown. Some birch then, gathered on my holiday, and badly coated with honey-dew, was carelessly offered to the larvae, with dire results. They were at once attacked with diarrhoea, and the whole of a very fine brood quickly succumbed. Only a single moth was reared. All the birches were saturated with sticky honey-dew that year, but I should have washed the food and taken reasonable care. Haggart (*Entom.*, 66 (1933), 29) inti-

mates that they are very difficult to rear, dying off when full-grown. This may be so, but I blame myself for the failure."

But *was* the honey-dew the cause of this failure? May not this have been, again, a case of *post hoc, ergo propter hoc*? Mr Haggart's actual words, in *The Entomologist* just quoted, are: "A large number of ova were distributed to correspondents last year, and it seems from their reports that they managed to bring the larvae to maturity successfully, but completely failed to get them to pupate, the one notable exception being the veteran entomologist, Mr Charles Young, of Rotherham, who managed to rear 25% of his lot." Unhappily, Mr Haggart makes no mention of the foodplant, either in the article just quoted or in a previous article (*Ent.*, 64, 271), and we are left in ignorance of the methods and foodplant adopted by the successful rearer as well as of the foodplant and methods of those who failed. It seems to me more likely, much more likely, that the failures, in my friend's case no less than in the other cases cited, were due to our insufficient knowledge of this insect's life-history. Prof. Frank Balfour-Browne has pointed out (*Ent. Rec.*, 56, 104) that larvae fed on a substitute foodplant may do well on it but will fail to pupate. Perhaps those larvae of *L. solidaginis* which are found in the wild feeding on birch always descend the bush to finish their larval stage on bilberry or bearberry, or perhaps it is the other way round. How often in our cages have we saved a brood by changing the foodplant or wetting the foliage!

My friend's *solidaginis* died from diarrhoea. Can any other experienced rearer of Lepidoptera bring forward additional evidence of larvae of other species dying from this complaint after eating honey-dew? Knowing something of the anatomy and physiology of lepidopterous larvae I should have thought that any carbohydrate in excess of its normal requirements would have been excreted almost unchanged. Let us look at the matter a little more closely.

First of all, what is honey-dew? It is the excrement of a plant-sucking hemipteron, an aphid. It is a copious clear fluid and it contains organic matter derived from the plant juice, particularly carbohydrates, which the insect has been unable to use. On analysis it is found to contain—though it varies in composition in the same aphid feeding upon different plants—about 85 per cent. carbohydrate and 3 per cent. protein. The 85 p.c. carbohydrate contains sucrose 16.7 p.c., invert sugar 24.5 p.c., and dextrin 39.4 p.c. The plant juice has a carbohydrate content of about 90 p.c. and protein about 5 p.c. Honey-dew is, of course, the principal food of many Lepidoptera in the imaginal stage.

Plainly the digestive juices of a caterpillar must be adapted to its customary diet; so our larvae, since the plant juices which they absorb contain so high a percentage of carbohydrate, must, and of course do, contain enzymes to deal with carbohydrates. As Wigglesworth remarks (*Principles of Insect Physiology*, 1939, p. 275) "Insects which live on food rich in some particular substance generally produce the appropriate enzymes in particular abundance," and the presence of invertase and maltase (with amylase and protease) have been demonstrated in the digestive juices of caterpillars. Honey-dew therefore should present no difficulty to a *healthy* larva so far as its digestion is concerned, and I know of no reason why any excess of carbohydrate should not be excreted normally, as with the aphid. For it is plain that a larva which feeds on,

let us say, oak or birch in June cannot expect to pass through this life without ingesting a certain amount of honey-dew.

So I put forward for your consideration the suggestion that the reason why my friend's *solidaginis* contracted, and died from, diarrhoea may have been something quite different from honey-dew.

But I wish I knew why my *Leporina* died.

LUDIUS FERRUGINEUS, L., AB. OCCITANICUS, VILLERS (COL. ELATERIDAE), AN ABERRATION NEW TO THE BRITISH LIST.

By HORACE DONISTHORPE, F.Z.S., F.R.E.S., etc.

Towards the end of June 1945, a certain number of perfect insects of *Ludius ferrugineus*, L., was reared from larvae taken in felled elms in Windsor Forest in 1943 and 1944. One of these possesses an entirely black thorax and is, in fact, the fine aberration *occitanicus*, Villers. This form, which is very rare on the Continent, has not occurred in Britain before. My friend, Mr A. A. Allen, writes to tell me that he has also reared *occitanicus* this year, from a larva from the same source as mine. We therefore share the credit for adding this nice ab. to our list.

It may be remembered that at a meeting of the R. Ent. Soc. of London on 5th October 1927, I read a paper on the Bionomics of *Ludius ferrugineus*, L. The late Miss F. J. Kirk and I discovered the larvae in Windsor Forest in 1926. In 1927 and subsequent years we reared and distributed over 50 perfect insects. At that time *L. ferrugineus* had not been found in Britain for nearly 100 years.

I may mention that last year I also reared a certain number of specimens from 1943 larvae.

A STUDY ON THE EXCAVATION OF MOUNDS BY THE ANT PHEIDOLE PALLIDULA, NYL. (HYM. FORMICIDAE) ON A SMALL AREA OF GROUND.

By W. PICKLES, F.R.E.S.

In continuation of studies on the excavation of soil by ants (see Pickles 1941-43) a small piece of ground of 143 square feet in area and measuring 13 ft. by 11 ft. was investigated, when it was discovered that there were a large number of mounds of excavated material there from the mouths of the nests of the ant *Pheidole pallidula*, Nyl. It is not claimed that each individual mound was a separate nest; but it was obvious that several of these mounds did belong to the same nest system.

Scattered over this small area of ground there were 51 nest openings, each with a circular pile of excavated material around it. These were first noted on 1st April 1945, but they were first counted and investigated on 7th April 1945. At the time of visiting the area on the latter date the ants were busy carrying on the excavations and adding further material to the mounds. The mounds were not uniformly distributed over the area, there being a variation in the number of mounds per

square foot of from nil to four giving an average of 2.8 mounds per sq. ft. Neither was the distribution of the nests regular in that there was a decided concentration towards the southern side of the area. The diameter of the mounds varied considerably from 1 inch to $3\frac{1}{2}$ inches, with an average of 2.11 inches diameter.

Taking the average diameter of a mound as 2.11 ins. then the average area of each mound would be 3.46 sq. ins. and the total area covered by excavated material would be 176.5 sq. ins. which is considerably more than one square foot in area.

At intervals the soil from these mounds was swept up, dried and weighed with the idea of ascertaining the rate at which excavation was proceeding and the total weight of soil brought up. The actual excavating by this species of ant appears to be independent of weather conditions: with some species of ant, e.g. *Tapinoma nigerrimum*, Nyl., and *Messor barbarus barbarus*, L., for instance, building or excavation only takes place after rain or during humid atmospheric conditions.

In Table 1 a record of the excavations is given.

TABLE 1.—EXCAVATION OF SOIL BY THE ANT *PHEIDOLE PALLIDULA*.
(All weights are given in ounces.)

Date.	Total wt. of soil excavated.	Average wt. of soil excavated per nest.	Average wt. of soil excavated per sq. ft.	Average wt. of soil excavated per day.	No of days.
1.iv.45	—	—	—	—	—
8.iv.45	10.7	0.21	0.07	1.53	7
13.iv.45	7.0	0.14	0.05	1.53	5
23.iv.45	10.0	0.19	0.07	1.00	10
3. v.45	13.8	0.27	0.10	1.38	10
19. v.45	2.2	0.04	0.01	0.14	16
27. v.45	—	—	—	—	8
Totals	43.7	0.86	0.31	0.77	56

From the Table it will be seen that in 56 days over which time observations were carried out, 43.7 ozs. of soil were excavated at the average rate of 0.77 ozs. per day and this was laid on the surface at an average weight of 0.31 ozs. per square foot. This weight of soil is more than $2\frac{1}{2}$ lbs. and is a considerable weight over a small area such as this. Imms (1934) quoting Drummond ("Tropical Africa") mentions the effect of termites on the circulation of soil being similar to that of the earthworm; it would appear then that over this short period of time this species of ant is fulfilling its share in the circulation of soil. Throughout the district this ant is common and its circularly excavated mounds are very numerous so that over a large area of ground a considerable amount of soil will be brought from below and exposed to the effects of the elements each year.

I wish to thank Mr H. St J. K. Donisthorpe for kindly identifying the ants for me.

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COLLECTING NOTES.

PIERIS BRASSICAE SWARMING ON THE DORSET COAST.—From Saturday, 28th July, to 3rd August this species has been coming to the shore in teeming thousands from here to Weymouth and to Studland in the East, the cliff face, and fields edging the seaboard has been covered with the "White Wings Pest."

They all come from a S.E. direction, some seem very weak, alight on the wet sand and crawl around, while others fly robustly in, settling on the charlock, ragwort and valerian before their journey inland; most are in fresh condition. The majority are ♀♀.

The peak was reached yesterday, 3rd August. I have had a grand stand position here from which to observe them.—LEONARD TATCHELL, Coast Guard Look Out, Swanage, 4th August 1945.

COLIAS HYALE IN DORSET.—On Tuesday last, 31st August, I spent a few hours at Kimmeridge, Dorset, and observed two examples of *C. hyale* in perfect condition. There were also plenty of worn *Vanessa cardui* this past month.—L. TATCHELL.

ABERRATION OF VANESSA CARDUI.—This afternoon, 25th July, by the Dallington New Road, near Battle, Kent, I saw a butterfly which I thought must be a "Painted Lady," yet it did not quite look like one. On looking it up in South's book I find it was like the variety 4 on plt. 49 facing page 83, though not exactly the same. It settled again on the ground near and it was not like the specimens shown on plt. 45 facing page 79. I saw two of them—one was a bright specimen, the other was duller.—(Miss) M. FOOTE, "Abbey Oak," Battle.

SYMPETRUM FLAVEOLUM, LINN., IN SURREY.—Members of the London Natural History Society recently visited Godstone and Esher to study the species of Dragonflies that were about, and on each occasion were fortunate enough to capture a specimen of this migrant, as well as other species of more common occurrence.—H. J. BURKILL, 3 Newman's Court, Cornhill, E.C.3.

ABUNDANCE OF PIERIS BRASSICAE.—This species is swarming now (early August) in our garden at Fetcham and there is apparently a big immigration swarm passing across. I have seen a good many *P. napi* among them, but not so many *P. rapae*. They do not seem to be pairing as yet, but mostly sipping at flowers and flying on towards the north-west. *Pararge megera* seems as plentiful, but that species is flitting about and not moving on.—ID., 5.viii.45.

A NOTE CONCERNING DR MALCOLM BURR'S ARTICLE ON THE ISLAND OF PLATY.—When reading this most interesting article concerning visits to the Island of Platy in the June issue of the *Entomologist's Record*, I was struck by his observation on the effect of the bush fire on the insect population in which he states " Numerous nests of *Messor* seemed to be lifeless."

The date of his visit was 15th August and a typical baking Mediterranean summer day. The reason for the apparent lifelessness of the nests of *Messor* I venture to state was that, at the time of visiting, the ants were having their " siesta " and was not due to the destruction of the nest by the heath fire. I have noticed that among several species of the genus *Messor* (*Messor barbarus*, L., *M. aegyptiacus*, Emery, ssp. *canaliculatus*, Donisthorpe, *M. (barbarus)* subsp. *minor*, Er André., *M. (barbarus)* subsp. *structor*, Latr., and *M. (barbarus)* subsp. *meridionalis*, Er André.) that between certain hours of the day, i.e. during the heat of the day, they have a " siesta " in that they do not emerge from the nest during these hours. The length of time over which the " siesta " extends varies with the time of the year and the particular day.

Moreover, whilst making a survey of the ecology of ants in Algeria (of which *M. (b) barbarus* and *M. aegyptiacus* ssp. *canaliculatus* were two of the species), a heath fire broke out on 5th July 1943 and destroyed everything on the area under observation—all vegetation was charred and even calcined by the heat, yet on the next day (6th July 1943) ants from nests of both the above species of *Messor* were out in processions at 6 p.m., D.B.S.T. Had I visited the spot about noon, or a few hours either side of it, I might have come to a similar decision as Dr Burr that the nests had been destroyed by the fire.

Apparently the ants must have gone deep down into the nest, whilst the fire raged above, and so they were saved. When things had cooled off they re-emerged apparently none the worse for wear and continued their foraging activities.

I thought that this observation on the " siesta " of ants and their reappearance after a heath fire might be of interest in view of Dr Burr's statement.—W. PICKLES, 72 (Br.) General Hospital, C.M.F., 17.vii.45.

TRICHIOSOMA TIBIALIS (HAWTHORN SAWFLY).—On 8th July I noticed that something had been eating the leaves of a Rowan tree in the garden, and was surprised to find a larva of *T. tibialis* in the usual curled up position at the back of one of the leaflets.

The larva has fed well on Rowan since I found it, and is now (19th July) practically full grown.

I have found this insect on Hawthorn hedges in this district for some years past, but have never seen it on the foliage of any other tree before.—J. FINCHAM TURNER, Morden, Surrey.

HYLOICUS PINASTRI, L., AT SOUTHAMPTON.—From old-time entomologists I used to hear reports that this species had been taken on Southampton Common, which led me twenty years ago to make a rather hopeless search, before ever I made acquaintance with the moth abroad and in Bournemouth pleasure gardens, and learned something of its

habits. I reported then that it was certainly not to be found on Southampton Common, a statement both presumptuous and ridiculous. Now that I live within a few steps of the top of the Common, and am allowed to walk only quite short distances, I have looked regularly on the few pine trunks where the humble civilian may go, as I walked slowly to tram or bus. On 30th June two ♀♀ were found about five feet up; on 3rd July another ♀ at the same height; and on 9th July another ♀ about ten feet up. All four were facing south-westerly, and were of the lighter form. One other specimen from a suburb of Southampton has been reported to me by a friend.

The question arises as to whether the moth has spread from its probable headquarters in Dorsetshire, or whether the species has been always present here in Hampshire. We are all too much inclined to accept the statements we find in the books, and rarely dream of looking for a species that has been recorded only from localities far from our own hunting grounds. In the case of the *Micros*, one rarely finds a species unless one makes special and careful search at the right time in likely places, when often it is found in abundance, especially in the larval stages. Even so large a moth as *pinastri* is not really conspicuous, and it may well be that I have not seen it before on Southampton Common simply because I never really expected to see it there, and so never really searched for it.—WM. FASSNIDGE.

NOTES FROM THE PORTSMOUTH AREA.—*S. tiliæ*.—From a dug pupa, a specimen emerged last month, with the markings on the right wings and left hindwings normal. On the left front wing, the central markings are reduced to one spot.

D. galii.—A larva of this species was brought to me on the 6/7/45. It was found on the shores to the eastern side of Portsmouth, and was feeding on Rose Bay Willow Herb.

O. suspecta.—It is seven years since I have done any night collecting, but last night (7/7/45) I was pleased to secure 5 specimens of this moth. Previously, near Portsmouth, I took one in 1928, eleven in 1929, and two in 1934. I have never succeeded in taking the larva of this species, in spite of intensive efforts. Does it feed high up, as my captures have been among birch trees which are too tall to beat?—A. H. SPERRING.

Since writing the above, another 13 *galii* larvae have been brought to me from the same locality as the one previously mentioned.

SPRING EMERGENCE OF *A. ATROPOS*.—A specimen of this species was brought to the Museum here on 16th May, found the previous evening. It was dead but not yet stiff. The occurrence, though known, seems sufficiently unusual to be worth publishing.—(Rev.) GEORGE WHEELER, Worthing.

[The above was included in the MSS. for June but somehow disappeared and was found among a large bundle of return proofs and MSS. Have any other early appearances of this species been met with?]

PAPILIO MACHAON IN THE SWANAGE DISTRICT.—It is of interest to record six specimens of this butterfly. One taken near Anvil Point Lighthouse, one at Swyre Head and one on the North Downs. Those observed

were one at Swyre Head, and two on the Studland side of the Purbeck Range. All occurred in the first 14 days of August.—LEONARD TATCHELL, Swanage.

BUTTERFLIES AT SWANAGE.—The following species have been very numerous in the Swanage district during August:—*P. aegeria*, *P. megera*, *S. galathea*, *E. semele*, *A. hyperantus*, *A. aglaia*, *V. cardui*, *V. atalanta*, *N. io*, *A. urticae*, *P. c-album*, *G. rhamni*, *P. coridon*, *A. sylvestris* = *linea* (*thaumas*), *T. acteon*, and *O. venata* = *sylvanus*. Only two *N. polychloros* and one *C. croceus*.—LEONARD TATCHELL, Swanage.

A LOCAL LIST.—As I am at present engaged on the preparation of lists of the Lepidoptera of Devon and Cornwall could you please insert a note in the *Entom. Record* requesting entomologists, who have collected in these counties, to communicate with me.

I am aiming at completion of these lists by December of this year, and the records most urgently required are of the Micro-lepidoptera.—J. HEATH, "Heathcot," Hedge End, Southampton.

MIGRANT BUTTERFLIES IN S.E. KENT.—I happened to be passing a field of lucerne in the late afternoon of 3rd August, and noticed a good many *Colias croceus* (*edusa*) flying there. Next day, I was there again, and in the afternoon they were flying freely, accompanied by *Colias hyale*, of which I must have seen quite a dozen, though doubtless some of them were the same individuals flying backwards and forwards.

They were apparently males and were flying at great speed. I made several attempts at capturing them, but they beat me every time; and all I got was one female.

The next day there were not many to be seen, but one fine male was taken by a gentleman, who was with me.

After this, I made a good many visits to the spot, and saw plenty of *croceus* (*edusa*), but no more *hyale* until 16th August, when I captured a very fine male, the only one seen.

On the 4th August, in the same field, I was very surprised to take two *Pontia daplidice*, not in very good condition. Some people I met there told me that a number of them had been seen this year.

In the same place, on 5th August, I twice netted and released a very battered female *Papilio machaon*; and after that I began to wonder what was going to turn up next.

The break in the weather that followed the early heat-wave this month has rather interfered with further discoveries.—CECIL M. GUMMER.

A FEW NOTES FROM SOMERSET: LEPIDOPTERA IN 1944.—Despite the inclemency of the weather during 1944, I was pleased to notice a decided increase in the number of a few of our local butterflies; for instance, *Cupido minimus*, *Argynnis paphia*, *Eumenis semele*, and *Adopoea thaumas* [*linea*; *flava*; *sylvestris*.—Ed.]. At the same time others were not so plentiful; while *Colias croceus*, *Strymon w-album*, *Vanessa cardui*, *Argynnis cydippe*, *A. aglaja*, and *A. selene* were not observed at all. *E. semele*, which showed a slight increase in 1943, appeared in some strength locally, and one or two even visited my garden. On 24th July,

while my wife and I were on Castle Hill, Clevedon, during the late afternoon, we sat for a while on a slope overlooking the Bristol Channel. Flying around us were a number of *E. semele*, and several *Macroglossum stellatarum*, both, apparently, interested in an outcrop of rock upon which they frequently settled, evidently enjoying the warmth created by the sun. The *semele* especially amused us by also alighting on our clothing, and once even on the back of a papillon dog which accompanied us. *Argynnis paphia* was in abundance along the borders of woods; the females being much more in evidence than I have ever seen them, the last being noticed as late as 23rd August. I was also glad to see that one of the little colonies of *Cupido minimus*, formerly restricted to a small corner of a rough piece of land, had spread over a considerable area of the ground; and on 2nd August, I was rather surprised, considering the peculiar summer, to meet with an example of a partial second generation which, judging from its fine condition, must have only just emerged. I have several times come across specimens of a second brood on the Sussex downs, but never before in Somerset. The first brood of *Heodes Phlaeas* was conspicuous by its absence, but the second emergence turned up, though not very plentifully, during July and August; and on the 2nd of the latter month I was pleased to net a fine example of ab. *radiata*. In the same locality, on 23rd August, I captured a rather nice form of *Aglais urticae*, closely approaching ab. *ichnusa*. Last year I was agreeably surprised to see several *Limenitis camilla* in a wood not many miles away, where I had not observed it before. On visiting this wood in 1944, the sun, unfortunately, became obscured by dense, rolling clouds, so I failed to see if it had turned up again; but on 2nd August, I watched a late, and very dilapidated female, in another wood, flying quietly about in a sunny glade, so am hoping this beautiful butterfly will be allowed to establish itself in this neighbourhood.

Until this summer I had not imagined how the sudden scarcity of a lepidopterous insect could change the appearance of the landscape. Up to 1943 *Callimorpha jacobaeae* was exceedingly abundant on the surrounding hills, with the result that most of the *Senecio jacobaea* was almost completely demolished by the ravages of the larvae; only unsightly webbed stalks being left to show where they had fed. During 1943, the number of *C. jacobaeae* became greatly diminished; and in 1944, the moth had become almost uncommon. Consequently the ragwort flourished exceedingly, and, from a picturesque point of view, the beauty of the countryside was much enhanced by the considerable masses of the bright, golden flowers which clothed the uplands. Not unnaturally the county agricultural authorities became so perturbed by the apparent great increase of this plant that an urgent S.O.S. was sent out, through the agency of a local newspaper, asking for the best method of destroying the weed.

On 1st July, my youngest son found, amongst other things, two larvae of *Phragmatobia fuliginosa* at Berrow. These spun up a day or two later, and the moths, two splendid females, emerged on 20th and 24th of the same month; examples of rapid transformation!

Cleora repandata is not uncommon in my garden, where, during the last few years, we have obtained four specimens of ab. *nigricata*. One of the two taken this year was found at dusk, looking very black and

conspicuous, on a panicle of a white-flowering plant of *Centranthus ruber*. This attractive plant was more luxuriant than usual, yet, curiously enough, was not so alluring as in former years. Not even *Plusia gamma* visited it in its usual profusion, which was rather a blessing, and fewer *Deilephila porcellus*; but among the more interesting moths netted from it were: *Agrotis exclamationis*, ab. *plaga*; *A. corticea*, *H. carpophaga*, *Apamea sublustis*, *Pyrria umbra*, and *Myelois cribrella*. At bladder-campion (*Silene inflata*), our best captures were a few *Hadena conspersa*, not previously taken in our garden.

Two unexpected captures were made in the house; one *Nonagria typhae* ♂, a remarkably small specimen, only two-thirds the normal size, found by my son on the wall in his room; and a very fine *Eumichtis lichenea* ♀, at rest on an armchair, close to my cabinets, as if waiting to be included in the collection! How they came to be there is a mystery, as attraction by light was, of course, out of the question.

At dusk, on 6th July, I netted in my garden a small Pyrale which was buzzing actively about like a fly around the blossoming sprays of a parsley-leaved blackberry, but it was then too dark for me to identify it. On examining it later, by light, I found it to be a female specimen of *Pyrausta aurata*, a species usually considered to fly only in the daytime during bright sunshine. It was a very warm, still evening with an occasional slight drizzle, followed later by thunder, so, possibly, these climatic conditions had something to do with the unusual time for the insect to be on the wing. Other day-flying moths that I have previously taken at dusk, or later at night, have been *Acontia luctuosa*, two males and one female, attracted into the house by light, at Churchdown, Gloucestershire, on 19th June 1936; *Bupalus piniaria* ♂, netted at dusk at Brockweir, Gloucestershire; *Chiasmia clathrata* and *Ematurga atomaria*, frequently at light, especially the former, at Churchdown; and *Pyrausta purpuralis*, at light, also in Gloucestershire.

Whilst walking along a grassy path, or ride, bordering a wood, on 6th September, I happened to glance down and saw, resting on the ground, a fine *Amathes glareosa* ♂, comfortably occupying a small bare patch in the turf, into which it just fitted. This is the first time I have found it during the day time, and I find that my experience accords with Barrett's remark that, "The moth is very rarely seen in the day time; doubtless it hides among heather and herbage close to the ground" (*Brit. Lep.*, iv, 33). Later in the month my son obtained another specimen at ivy-blossom. Ivy was late in blooming, and was not very productive, probably owing to the coldness of the weather. With the exception of *A. glareosa*, only a few very common species were observed, including one fresh *Opisthagraptis luteolata*, on 18th September, the latest date that I have recorded this moth. I might also mention that we also found a larva of *Melanchra persicariae* browsing on the flowers.—J. F. BIRD, F.R.E.S., Redclyffe, Walton St. Mary, Clevedon, Som.

THE DIAPAUSE IN CALCUTTA LEPIDOPTERA.—The very interesting note on the diapause (Wiltshire, *Entomologist's Record*, 57: 49-51) made me enumerate the Calcutta species of Lepidoptera that appear to have one.

Taking the Rhopalocera first, I cannot say that any of the species that I have bred has a diapause. Brood succeeds brood throughout the year, development taking rather longer in the cold weather than in the

hot. Talbot (*Fauna Brit. Ind.*, Butterflies, i (2nd edit.), 178) states that *Papilio polytes*, L. sometimes remains for a long time in the pupal state, but, with the exception of one pupa formed in December 1944, which took over two months to emerge versus the usual ten or twelve days of the others of the batch, I have not found this.

Of the commoner species that I have not bred, three only, *Graphium nomius*, Esp., *Neptis hylas*, L., and *Neptis jumbah*, Moore, are single brooded, appearing in March/April and at no other time. Sanders (1944, *Journ. Beng. Nat. Hist. Soc.*, 29, 29-44) records *Papilio polymnestor*, Cr., as being found chiefly in March and October, *Papilio crino*, F., *Charaxes polyxena*, Cr., and *Neptis columella*, Cr., in March, and *Rapala pheretimus*, Hew., in April. *P. polymnestor* is uncommon, but I have taken it rarely throughout the year. I cannot recall when I caught my one Calcutta specimen of *crino*, but I do not think it was in March; in any case, both *crino* and *polyxena* are far too rare to base conclusions on; *columella* and *phetimus* I have not caught. Sanders considers the Calcutta subspecies of *hylas* to be *varmona*, Moore, whilst I consider it nearer *adara*, Moore. The two subspecies of *hylas* common in the hills, *varmona*, Moore, and *astola*, Moore, appear to be continuously brooded.

Of the Heterocera there is only one species, *Eupterote undata*, Blanch., that is single brooded. The imagines of this species appear in June/July, and the larvae, which grow very slowly, can be found till January. Whether this species has a diapause, or whether its single-broodedness is due to very slow development, I cannot say. Larvae of two Limacodid species, *Thosea tripartita*, Moore, and *Narosa doenia*, Moore, when spinning at the beginning of the cold weather, do not change to pupae for some two months or so, although *tripartita* changes in the normal way after a rest of a day or two when it spins in the hot weather. I have only had the one batch of *doenia*.—D. G. SEVASTOPULO, F.R.E.S., Calcutta, 22.vii.45.

REPUTED MIMICRY IN *PARERONIA VALERIA*, CR., CONSIDERED WITH REFERENCE TO OTHER INDO-AUSTRALIAN PIERIDAE.—From his note (1945, *Entomologist's Record*, 57: 45), Dr Richmond Wheeler appears to have missed my point regarding the difference between the flight of the two sexes of *P. valeria*. It is much more than a mere difference in speed, the female normally has a slow, Danaid-like, sailing flight, the male the usual, fairly fast, Pierid one. *P. valeria* has become much rarer in Calcutta of late, owing to the formerly Capparis-infested waste ground being now built over or browsed bare by goats, but my recollection is that the female changed to a fairly fast Pierine flight when disturbed, in the same way that *Chilasa clytia*, L., changes from its slow, sailing, Danaine flap to the typical, swift, Papilionid flight when alarmed. I have not seen enough of *Appias* to be able to comment on its flight, but, from the little I have seen, I would say that the male had a swift Pierine flight, the female a slow one, not unlike the flight of *Cepora*.

In any case, the difference in the outline of the wings between the two sexes of *Pareronia* is not very marked, nothing like the difference between the two sexes of many species of *Appias*. In the *Fauna of British India*, Butterflies, neither Bingham (1st edit.) nor Talbot (2nd edit.) mentions any sexual difference in the shape of the wings in the generic description.

Finally, if I have fallen into fallacies by neglecting facts that do not accord with popular theories, I am in good company. Talbot, in the *Fauna of British India*, writes regarding the females of this genus: "They resemble *Danaines* very strongly, not only in pattern but also in flight. The female may be monomorphic, dimorphic, or trimorphic, the pattern in each case resembling particular *Danaines* found in the same locality." The word mimicry is not used, but the inference is obvious.—D. G. SEVASTOPULO, F.R.E.S., Calcutta, 12th June 1945.

PREVALENCE OF SOME RHOPALOCERA IN FIRST HALF OF 1945 IN BRISTOL DISTRICT.—Very favourable weather conditions prevailing in the early months of this year, no doubt, were the cause of many species of butterflies occurring in great numbers, compared with recent years. In early April and May the Holly-blue (*Lycaenopsis (Cyaniris) argiolus*) was observed everywhere and hundreds of specimens might have been taken as against a few only in late years. Likewise I found the Marbled White (*Satyrus (Melanargia) galathea*) in very large numbers in one spot where an average number only was seen in years past. I took some 50 very fine specimens in a couple of visits to the locality. A bit later in early July, and in the same locality, I found the Purple Hairstreak (*Thecla quercus*) in fair quantity and took a nice series. This was a new find for the locality.

The Orange-tip (*Euchloë cardamines*) was commoner than usual in May and June, and the female, which is always very much scarcer than the male, was in good proportion to the latter. In some hundreds taken of the above-mentioned four species I was disappointed that there were no vars. as might have been expected; also out of 300 *Nymphalis (Vanessa) io*, bred this month, July, from two batches of larvae, there was not a single variation from the typical form.

The "Common Blue" and the "Copper," on the other hand, have been very scarce to date. There were rather severe frosts as late as the 15th May, which probably accounted for the scarcity, although other common species were in their usual numbers.

The "Holly Blue" has appeared again in late June and in July, and as it should be about in September next it will be three brooded this year. Even in the June-July brood specimens have been numerous.

I invite correspondence with other entomologists throughout the British Isles regarding their observations of the greater prevalence of certain species this year, and I would like to exchange specimens.—CHAS. B. ANTRAM, "Rivermead," Keynsham, near Bristol, Somerset, 26.vii.1945.

"KING GEORGE" BUTTERFLY.—I was very interested to read Mr Horace Donisthorpe's note, in the June issue of the *Record*, commenting on the name "King George" Butterfly. In the Furness district of Lancashire that name is in common usage and is applied to any reddish or red-brown moth or butterfly. Chiefly it is used for *Aglaïs urticae*, L., and *Nymphalis io*, L. No doubt it would be used for *Arctia caja*, L., also if that species occurred commonly. It would be interesting to know how the name arose. From inquiries made it would seem to have been used in this district for quite thirty years.—Dr NEVILLE L. BIRKETT, The Cottage, Kilner Park, Ulverston, Lancs.

"THE KING GEORGE BUTTERFLIES."—I have just received this month's "Ent. Record" and was interested in Donisthorpe's note re "King George Butterfly," and perhaps my experience may be of interest.

In the early part of the present century I spent my holidays in S. Devon for several years in August. On one occasion I was collecting near Bovey Tracey, and was being watched by a lad of about 15 years old. A lot of butterflies of either Peacocks or Red Admirals were on flower heads. I asked if he could tell me the names of them, and to my surprise he promptly answered that they were "King Georges." Another year I was hunting for *C. hera* (Jersey Tiger) near Starcross and had just netted one and asked a lad who was watching if he knew its name; he, like the other, promptly answered it was a "King George." I came to the conclusion that probably all brightly-coloured Lepidoptera were called "King George."—A. H. HAMM, Oxford, 19.vi.45.

KING GEORGE BUTTERFLY.—In my young days in South Staffordshire all the so-called "Coloured" Butterflies in contrast with the Cabbage Whites were known amongst the village lads as "King Georges." This name was invariably applied to the Peacocks and Red Admirals. The Small Tortoiseshell was called the "little King George."—WALTER L. FREER, The Rectory, Evershot, Dorset.

CURRENT NOTES.

"CURRENT NOTES" have been more or less in abeyance of late owing to the number of interesting and useful "Collecting Notes" combined with shortness of space, shortage of paper, and increase in costs.

WILL all contributors who wish for REPRINTS mark their MSS. with the number they wish to order. Our printers deal with us as reasonably as they possibly can. Some of the firm are naturalists themselves, we understand.

OLD continental friends and correspondents are gradually returning to their routine of nature study. First to write was that famous Italian collector, Orazio Querci, who wrote me from Rome quite ready to collect and anxious to see our magazine again. Then Skat Hoffmeyer, Bishop of Aarhus, Denmark, who was a member of the "resistance movement" and last winter was compelled to "go underground," sent me a digest in English of his article in *Fauna og Flora* on the "twin-species" *mucronata-plumbaria* in Denmark with a plate figuring a dozen forms of each species. He was a great friend of the Rev. C. R. N. Burrows. Next came a request from Mr P. Lampke of Amsterdam wishing to come over to England, with queries about the *Ent. Record*, and a request for a list of all the new names of Palaearctic Lepidoptera published in our three British Magazines. More than 70 new descriptions had appeared in the *E.R.* alone in the five years of war, well supporting its sub-title of "Journal of Variation." The next entomologist who has written is Dr Verity of Florence, whose address is in the country since his house was completely demolished, but the bulk of his possessions had been saved. He too was anxious to know about all interesting matter in the *E.R.* The *Annales* of the Belgian Ent. Socy. gave a short

obituary of the editor, M. Derenne, of "Lambillionea," the magazine formerly entitled "Revue-Namuroise," who had lost his life during a raid on Brussels. This is the only casualty I have heard of among my correspondents so far.

REVIEW.

"THE HISTERIDAE ASSOCIATED WITH STORED PRODUCTS." *Bull. Ent. Research*, 35, 309-40 (1945). By Dr H. E. Hinton.—This valuable paper should be of great use, not only to the specialist, but to all students of Coleoptera, especially the British Coleopterists. A comprehensive summary of the family characters of the Histeridae is first given, both for adults and larvae, and a broad general account of the biology of the family follows.

It is shown that about 3200 species have already been described. Fourteen species are dealt with here, of which four have not been recorded from Britain before. Ten of these fourteen species are described in detail, and four, which have no doubt become accidentally associated with stored products, are only included in the keys. Apart from the keys to help in the determination of the adults; keys and numerous illustrations are given for the larvae of five species. One of the species recorded for the first time in Britain is *Dendrophilus xavieri*, Marseul. It occurred in warehouses and flour-mills in 1942 and 1943, and Hinton informs me that it was also found on several occasions in 1944.

In the difficult genus *Gnathonecus*, the author points out for the first time that secondary sexual characters are present consisting of broad flat setae on the first four joints of the front tarsi of the males.

Hinton correctly sinks *Gnathonecus nidicola*, Joy, as a synonym of *G. punctata*, Reitter. This view was also taken by Reichardt in 1941.

There are some 56 admirable drawings of the larvae, and the male genitalia. These figures include three beautiful drawings of whole beetles.

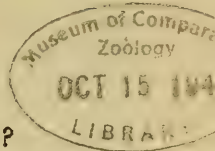
The complete distribution of the species mentioned is given, and a generous acknowledgment to captors of the same is made. A useful Bibliography completes the paper.—HORACE DONISTHORPE.

CORRIGENDUM TO IRANIAN LEPIDOPTERA, by E. P. Wiltshire, F.R.E.S.—A further study of my 1939-42 Persian material, which has just reached me safely in New York, necessitates one deletion from the list of species given in *Ent. Rec.*, July-August 1945, but also permits the addition of another species, thus maintaining the total of 70 new records from Iran.

Delete: No. 1. *Anthocharis cardamines*, L. (This was an error for *A. gruneri*, H.S., ssp. *armeniaca*, Stgr. The large Fars race is quite as white and big as true *cardamines*, but there is no need for a special name, since only its size separates it from *armeniaca*.)

Add: (After No. 30), *Monima incerta*, Hufn., 28.iii, 2.iv, 6.iv, Derband, oasis, nr. Tehran, 6000 ft. Also, p. 79, 1, 4; for 1942 read 1842.

- ab. *aliena*, Dup. (1836), *Hist. Nat. Supp.*, III, *Noct.*, 323, plt. 30, 1 (nec Hb.) = *errata*, Gn.
 f. *confluens*, Ev. (1844), *Faun-Volga-Ur.*, 245.
 f. *errata*, Gn. (1852), *Hist. Nat. Noct.*, VI, 99.
 ab. *pavida*, Gn. (1852), *l.c.*, p. 101 (nec Bdv.).
atlantica, Grote (1874), *Bull. Buff. S.N.S.*, II, 12. Amer. sp.?
discolor, Speyer (1875), *Stett. Ent. Ztg.*, XXXVI, 142. Syn. of *atlantica*.
ssp. laeta, Reut. (1888), *Act. Fenn.*, IX, 42.
 ab. *extincta*, Stdgr. (1892), *Rom. Mem.*, VI, 425.
 v. *uranica*, Splr. (1905), *Schmett. Eur.*, I, 171, plt. 36, 12.
 ab. *variegata*, Rbl. (1909), *Berge*, 9th Edit., 181.
 ab. *distincta*, Heinr. (1923), *Deut. ent. Zts.* (Beih.), 77.



Tutt dealt with: 1, typical *dissimilis*, Knoch, dark brown, markings traceable; 2, *w-latinum*, Esp., dark brown, mixed with ashy-grey, almost unicolorous; 3, f. *suasa*, Bork., pale brownish mottled with black; 4, ab. *confluens*, Evers., blackish almost unicolorous; 5, *atlantica*, Grote, Canada; 6, *discolor*, Speyer.

f. *permixta*, Hb.-Gey., 803 (1832-3).

DESCRIP.—A small, rather narrow-winged form; one of the lighter aberrations, but not the British form. The orbicular and reniform are very white and conspicuous, the white colour also extends to the costa along which are other whitish markings.

ssp. confluens, Evers., *Fn.-Volga-Uralensis*, 245 (1844).

ORIG. DESCRIP.—“Forewings blackish-fuscous with the submarginal area unicolorous; stigmata white-margined, usual transverse lines white, the submarginal line sharply bi-dentate in the middle:—hindwing blackish, cilia white.”

“Slightly smaller than *suasa*, but very similar to it and perhaps a variety of it, differs in its blackish colour and its unicolorous submarginal area without shades. In the area between these is found a series of white dots, the same as in *M. suasa*.” South Urals.

f. *errata*, Gn., *Noct.*, VI (II), 100 (1852).

ORIG. DESCRIPTION.—“Generally a little larger, of a grey testaceous yellowish, deeper on the disc and on the outer margins, with typical markings (of *suasa*), but the subterminal, although very well marked, extends less and is always preceded by sagittate marks about the middle and with a reddish flush in the base. The lower wings clearer, which allow the marking to be better seen.”

ab. *pavida*, Gn., *Noct.*, VI, 101 (1852) (nec Bdv.).

ORIG. DESCRIP.—“This *Hadena* appears quite intermediate between *suasa* and *aliena*, but it is much closer allied with the latter, of which, from more ample resemblances, I can only consider it to be a variety.

“It does not exceed the size of *suasa*. Its wings are more pointed at the tip than in *aliena*, the colour and the markings are the same; the subterminal line is a little more distinct, with the terminal area slightly black. The two median spots are more distinct, and better separated, moreover the reniform, which is suffused with ochreous on the outerside, is often found in *aliena* of this character.”

"I much doubt whether *chardinyi*, Dup., which Herr.-S. has just figured under the name *pavida* is the same thing. It appears rather, to me, that it ought to be placed in the first group with *adusta*, with which he himself compares it in his description."

ssp. *laeta*, Reut., *Act. Fenn.*, IX, 42 (1888) [Warr.-Stz., *l.c.*, p. 71, plt. 16g.

DESCRIP.—"From Scandinavia, Finland, and the Baltic coast, is an extreme form showing a pale patch at base of costa, and black wedge-shaped marks preceding the pale submarginal line." The figures, like many on the plate, are not good, all are overspread by a featureless brown.]

race *extincta*, Stdgr., *Rom. Mem.*, VI, 425 (1892).

ORIG. DESCRIP.—"The specimens are very dark, without light red-yellow or red-brown colouring, but the markings appear, especially in the ♂, distinctly, lighter grey and black intermixed. Especially are they characterized by this, that the outer transverse line with the letter M, which in all the *dissimilis* lying before me is white, here is not white, but is somewhat light grey (yellowish)."

f. *turanica*, Splr., *Schmett. Eur.*, I, 171 (1905).

ORIG. DESCRIP.—"In Turan. A pale grey-red, with distinct W, but only obsolescent marking."

ab. *variegata*, Rbl., *Berge*-, IXed., 181 (1909).

ORIG. DESCRIP.—"The most variegated form; forewing brownish, with distinct transverse lines, paler orbicular and reniform stigmata and prominent dark filled-in claviform. The area after the discal is band-like, light brownish-grey."

ab. *distincta*, Heinr., *Deut. ent. Zeits.*, Beih., 77 (1923).

ORIG. DESCRIP.—"In which the lower half of the reniform and often also of the orbicular are distinctly filled in with black." Digne.

Hadena, Ochs. & Tr. (1816-25), Dup., Gn., Tutt, Barr.: [*Melanchra*, Hb. (1811), Meyr., Meyr.: *Mamestra*, Hb. (1811), Stdgr., Splr., South, Culot: *Polia*, Ochs. & Tr. (1816-25), H.-S., Hamp., Warr.-Stz., Drdt. Stz.] *oleracea*, L. (1758).

Tutt, *Brit. Noct.*, III, 88 (1892): Meyr., *Handb.*, 84 (1895): Barr., *Lep. Br. Is.*, IV, 186, plt. 158, 1 (1897): Stdgr., *Cat.*, IIIed., 157 (1901): Hamp., *Lep. Phal.*, V, 135 (1905): Splr., *Schmet. Eur.*, I, 170, plt. 36, 24 (1907): South, *M.B.I.*, I, 241, plt. 120, 4-5 (1907): Warr.-Stz., *Pal. Noct.*, III, 73, plt. 17a, b (1909): Culot, *N. et G.*, I (1), 101, plt. 17, 4 (1911): Meyr., *Revis. Handb.*, 155 (1928): Drdt.-Stz., *Pal. Noct. Supp.*, III, 100 (1931).

Rösel, *Ins. Belust*, I (2), plt. 32, 45 (1746+)? gave a good figure, but the basic ground colour is too deep red.

Schiff., *Verz.*, 83, Noctuae O. 19 (1775). The "Kopflattich" Eule (Lettuce Noct.).

Illig., *Neu. Ausg. Verz.*, I, 279 (1801), identified this as the *oleracea*, Linn.

Esper, *Abbild. Noct.*, IV (I), 586, plt. 165, 4-8 (1790+), gave two figures of the imago, quite good. Fig. 5 was an ab. in which the W mark was somewhat irregular in shape, the orbicular a white ring with a darkish centre, and the markings on the underside submargin are slightly streaked basad and generally emphasized.

The white submarginal line well expressed in both. *l.c.*, plt. 136, 3. *W-latinum* is probably a var. of *oleracea*. The *leucographa* on plt. 150, 3, p. 491, is probably *oleracea* var. Wernebg. said this was the *spinaciae*, Bork.

Ernst & Engram., *Pap. d'Eur.*, VII, 162, f. 479 (1791), gave two very good figures, one more marked than the other. The authors call attention that Linné cited three whose descriptions or figures do not agree with it, viz., Réaumur, Frisch, and Mad. Merian.

Hb., *Saml. Noct.*, 87 (1802), gave a very good figure of an average British form with the submarginal white line not emphasized.

Tr., *Schmett.*, V (2), 131 (1825), discussed the question whether *spinaciae*, Bork., was a true species or only a local form of *oleracea*.

Treit., *Schmett.*, V (2), 132 (1825), said that the ground colour varied from rust-brown to blackish, and that rarely was it pale and then yellowish-grey. He confirmed Borkhausen's notes on the early authors difficulty; also he cited de Viller's synonym *montrosa*.

Dup., *Hist. Nat. Noct.*, VII (1), 20, plt. 101, 6 (1827), gave a very good figure of a typical form.

H.-S., *Sys. Bearb. Noct.*, II, 254 (1850), remarked on Hb. 87 that the forewing was too broad.

Gn., *Hist. Nat. Noct.*, II (VI), 101 (1852), gave *spinaciae*, Bork., as a Syn.

Barrett, *l.c.*, plt. 158, has two good average figures.

Stdgr., *Cat.*, III ed., (1901), gave only *variegata*, Aust. (multo palidior).

Hamp., *Lep. Phal.*, V, 135 (1905), gave only ab. *variegata* with *spinaciae* as a Syn.

Splr., *Schmett. Eur.*, I, 170, plt. 36, 24 (1905), gave a good figure of a deep red-brown typical form, and referred to the ab. *rufa*, Tutt, and ab. *variegata*, Aust., and added a blackish-brown form *obscura*.

South, *M.B.I.*, I, 241, plt. 120, 4-5 (1907), gave good figures of average British forms not greatly differing, reddish or purple-brown to dark brown.

Warr.-Stz., *Pal. Noct.*, III, 73, plt. 17a, b (1909) gave four figures, all of them poor, neither colour nor marking were satisfactory. They recognized ab. *obscura*, ab. *rufa* and ab. *variegata* and held the *spinaciae*, Bork., as a Synonym. (*ochracea* = *oleracea* on plt.)

Culot, *N. et G.*, I (1), 101, plt. 17, f. 4 (1911), gave a good figure of a normal Continental form, but only referred to ab. *rufa*, Tutt, and ab. *variegata*, Aust., as he considered other names had been given to most trivial aberrations.

Drdt.-Stz., *Pap. Noct. Supp.*, III, 100, 1931, added *obsoleta*, Lamb., for specimens with extinct reniform stigma. They corrected *bruneo-maculata*, which has dark brown not orange-yellow stigmata, and said

that *variegata* from N. Africa is lighter and more ochreous grey, with paler lines and purer white marking, with prominent stigmata.

Of the Variation Barrett said:—

Usually extremely constant in colour, though there is ordinarily a little variation in the tone of purple-brown colour and in the distinctness of the orange spot, but Mr Adkin states that specimens from the Scilly Isles are more mottled, while in Ireland, according to Mr Kane, especially in the extreme West, the tone is dark brown with only a trace of the orange spot, and the subterminal line almost obsolete. In Dumbartonshire, Scotland, it is found by Mr J. R. Malloch of a very dark purple-brown with hardly a tinge of the reddish colour remaining, but the orange spot quite distinct and the markings well defined. In the collection of Mr H. J. Turner is an example having the W in the subterminal line broadly suffused so as to form a bright white blotch.

The Names and Forms to be considered:—

oleracea, L. (1758), *Sys. Nat.*, 517.

spinaciae, Bork. (1792), *Naturg. Noct.*, IV, 450. Syn.

r. variegata, Aust. (1885), *Le Nat.*, III, 142.

w-latinum, Bork., *Naturg.*, IV, 378 (1792), probably a Syn. (See *genista*.)

race (ab.) *rufa*, Tutt (1892), *Brit. Noct.*, III, 88.

ssp. *variegata*, Roth. (1920), *Nov. Zool.*, XXVII, 58. Syn.

ssp. *variegata*, Obthr. (1920), *Lep. Comp.*, XVI, 154. Syn.

ab. *obscura*, Splr. (1907), *Schm. Eur.*, I, 170.

ab. *brunnea-maculata*, Hein. (1916), *Deut. Ent. Zeit.*, 515.

ab. *minor*, Cabeau (1932), *Lamb*, XXXII, 81.

ab. *nana*, Cabeau (1932), *l.c.*

ab. *minuscule*, Cabeau (1932), *l.c.*

ab. *obsoleta*, Lamb? [See Drdt.-Stz., *Pal. Noct. Supp.*, III, 100 (1931)].

ab. *pallida*, B. Salz. (1937), *Ent. Rec.*, XLIX, Supp. (6).

Tutt dealt with the (1) Linn. typical dark brown form and (2) the normal British red-brown form which he named *rufa*.

Bork., *Naturg. Noct.*, IV, 450, etc. (1792), described *oleracea*. He remarked on the inadequate description in the *Sys. Nat.* and continued by stating that there were three species so extremely alike as to be practically indistinguishable. The first was represented by Rösel, *Ins. Belust.*, I (2), plt. 32. The second was described by De Geer, *Mém. des Ins.*, II (1), 420, and attributed to Linné in the Appendix to his *Fauna*, i.e., the *Seposita*, p. 549, n. 2290, which is distinguished by the usual spots (stigmata) being white (orb.), yellow (ren.). The third is the Noctuid *dissimilis* (*suasa*) described by Knoch, which can be separated from both the other two by the claviform stigma. Bork. identified *dissimilis*, Knoch, as *suasa*, Schiff., and that De Geer said that his insect was not the *oleracea*, L., but was the same as that in the *Seposita*, n. 2290. Bork. then went on to describe *spinaciae*. It has the size and shape of *oleracea* with which it has uncommonly great similarity; but its larvae is more like that of *suasa*. The controversy went on until 1825 when Treit. reviewed the whole question and concluded that *spinaciae* was undoubtedly one of the typical forms of *oleracea* (*Schmt. v. Eur.*, V (2), 132 (1825)), and the third species was considered to be *suasa*, Schiff. (*Verz.*).

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

EDITED with the assistance of

MALCOLM BURR, D.Sc., F.R.E.S.

E. A. COCKAYNE, A.M. D.M., F.R.E.S.,
F.R.C.P.

J. E. COLLIN, J.P., F.R.E.S.

H. DONISTHORPE, F.Z.S., F.R.E.S.

T. BAINBRIGGE FLETCHER, R.N., F.L.S.,
F.Z.S., F.R.E.S.

W. FASSNIDGE, M.A., F.R.E.S.

Rev. G. WHEELER, M.A., F.R.E.S., F.Z.S.

By HENRY J. TURNER, F.R.E.S., F.R.H.S., *Editorial Secretary.*

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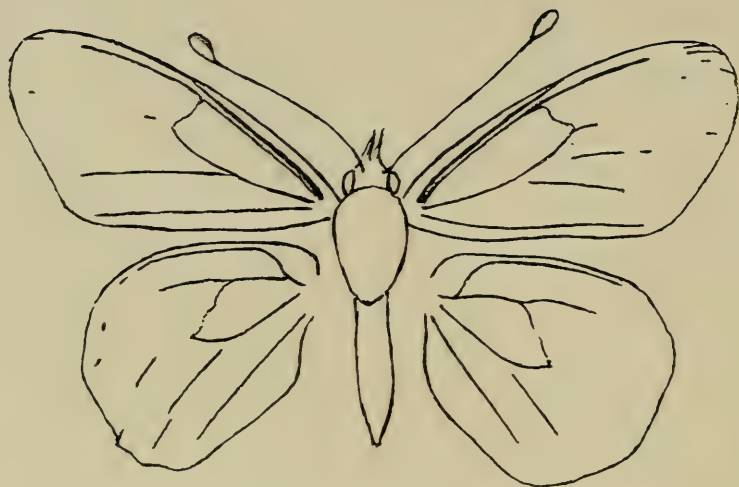
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PERONEURAL DEFECT IN BRENTIS EUPHROSYNE L.

PERONEURAL DEFECT IN *BRENTHIS EUPHROSYNE*, L.

(Plate IV.)

By E. A. COCKAYNE, D.M., F.R.C.P., F.R.E.S.

In 1941 I described and figured a *Papilio machaon*, L., with abnormal neururation and referred to the peroneural defect first described by Spengel, a condition, in which there is a failure of the whole system of neururation. Near the end of my paper I said that, unless my memory was at fault, two specimens of *Brenthis selene*, Schiff., with this defect had been taken at Market Rasen by Captain Crocker. My memory was unreliable, for one of these has come into my possession and proves to be a *Brenthis euphrosyne*, L., captured at Market Rasen, North Lincolnshire, by C. W. Sperring. This insect, of which I give a photograph and a diagram of neururation, is a male and shows a greater degree of peroneural defect than any example previously described. The alteration of pattern, due to absence of nervures, especially those of the marginal area, closely resembles that in other species. There is a complete absence of marginal lunules on the upper surface and an almost unbroken silver band near the margin on the under surface. The following is a description of the neururation. Forewing—the costal, subcostal, median, and discocellular nervures are present on both sides; nervure 1 is present on both sides, 2 is also present on both sides, but does not arise from the median; 3 is present on the right side, but does not arise from the cell and is broken into two parts; 4 arises from the cell on the right side, but runs a very short distance, and there is a small detached piece near the margin, on the left side there is only a small detached piece of 4 near the cell; there are very short pieces of nervures at or near the margin of the apex of the right forewing, apparently parts of 7, 8, and 9, and at the left apex there is a fragment of 8. Hindwing—the subcostal, median, and discocellular nervures are present on both sides; 1 is present on both sides, 2 is also present, but not attached at either end; parts of 3 are present on the left side, one part half-way between the disc and the margin and the other at the margin; 7 is present on both sides, but ends about half-way to the margin, and 8 is also present on both sides. As in other examples the unsupported wing membrane shows transverse folds where it is stretched between the ends of two incomplete nervures. The left hindwing has been broken and repaired by means of two patches on the under surface, which make it impossible to be sure that bits of the nervures between 2 and 7 are not present, but examination under a microscope after the application of wood naphtha did not reveal any.

A second *euphrosyne* with the same defect, but very worn and damaged was taken at Market Rasen at about the same time by Mr Sperring.

Four examples of peroneural defect in *Papilio machaon* have been recorded, one by Ahrens, captured in the Duchy of Brunswick, one by Spengel, bred from a larva found at Länggöns, Hesse, and two bred by Zimmermann v.1927 with a number of normal specimens in the same brood from Honnef on the Rhine. The one taken by Ahrens is figured both by Germar and by Meigen. A fine example in *Thais polyxena*, Schiff. and Denis was depicted by Herrich-Schaeffer and another by Mil-

lière. Millière says that M. Lederer bred four, all exactly alike, from pupae collected in Dalmatia. Thierry-Mieg named the aberration *ab. linda* in 1910, taking Millière's figure as the type, so that Bryk's *ab. neurochola*, named and figured in 1914, is a synonym. Härting gives a text figure of another example in *polyxena*. Frings says that there is a specimen of *Thais rumina*, f. *medesicaste*, Ill., in the Werner-Cöln collection with a complete error of development of the nervures like that in *Papilio machaon*, *ab. elunata*, Spengel. The *Argynnis aglaia* caught at Eastbourne by Inman, now in the Tring Museum, is another good example. In addition to these I have seen a *Lysandra coridon*, Poda, with an alteration of pattern almost certainly due to peroneural defect. The cause of this rare defect is uncertain, but there are two things in favour of it being determined genetically. The first is that most of the specimens recorded belong to two species, *Thais polyxena* and *Papilio machaon*, and the second is that W. Zimmermann bred two *machaon* from the same brood of larvae. It is also suggestive that Lederer bred four *polyxena* in the same year from Dalmatian pupae, and that two *euphrosyne*, the only two recorded, were taken at Market Rasen in the same year.

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A MARCH AFTERNOON'S COLLECTING IN CALCUTTA.

By D. G. SEVASTOPULO, F.R.E.S.,

Most accounts of collecting in India deal with the Hills, and it may, therefore, be of interest to describe an afternoon's collecting on a small piece of waste ground in the middle of one of Calcutta's residential areas.

The general locality is a residential district with biggish houses, mostly occupied by Europeans or Europeanized Indians, and standing in fair-sized gardens. The actual collecting ground is a patch of waste ground between houses, about a hundred yards square, in the middle of which is a fifty yards square patch of *Clerodendron infortunatum* (Ver-

benaceae), which is covered with flowers in February/March and which is then a great attraction for butterflies. The collecting ground contains a fair number of trees and bushes—Mangoes, mostly covered with *Loranthus*, Litchis, *Ficus* spp., *Carissa carandas*, *Polyalthia longifolia*, *Cassia fistula*, *Alseodaphne semicarpifolia*, *Flacourtia*, Bael and a *Solanum* sp. Round the edges of the *Clerodendron* patch is a sparse growth of grass, *Oxalis corniculata*, *Calotropis procera*, *Heliotropium indicum*, an Asclepiad creeper and a number of other unidentified plants. Later in the year, particularly after the rains have broken, there is a considerable growth of Arums of various species and of *Ampelopsis*, the food-plants of several of the Sphingidae.

On this particular afternoon, in early March last year, I cycled around at about 3 p.m. The sun was shining brightly and the temperature was about equivalent to a hot summer day in England.

The first butterflies to be seen were the four common Calcutta Danaids, *D. chrysippus*, *D. plexippus*, *D. limniace* and *E. core*, flying with their slow, sailing flight over the area surrounding the flowering *Clerodendron*. Many of the *E. core* were flying with the anal brushes of the males protruded, carrying the body curved downwards and forwards, the brushes showing up clearly because of their pale colour. I saw no *D. limniace*, the males of which also possess large anal brushes, flying in this way. A number of pairs *in cop.* of all four species were disturbed and I noticed that in all cases it was the male that flew, the female being carried hanging immobile. As a matter of interest I noted the flying position of all the pairs I came across *in cop.*: in *G. doson*, *E. hecabe*, *Y. hübnéri* and *R. amor* it was the female that flew, in *Z. maha* it was the male. It is easy to determine which sex flies, if a flying pair is followed until it settles it is invariably the flying insect that actually grips and takes the uppermost position.

Coming closer, the whole of the flowering patch was seen to be a mass of butterflies. *C. pomona* and *C. crocale* were flying about in their usual hurrying manner and occasionally dropping down to a flower for a second or two; a number of *D. eucharis* were flying slowly in the sun and others were settled on the flowers, with crowds of the common *P. polytes*, the females f. *stichus*—I saw no f. *romulus* and did not catch any f. *cyrus*; *P. demoleus* and *G. doson* were also feeding on the flowers. An occasional *G. nominus* visited a flower and then flew on, and there were a fair number of *P. aristolochiae*, which I had no difficulty in distinguishing from the f. *stichius* of *P. polytes*, of which it is supposed to be the model. A few *C. clytia*, both of the dark *Euploea* and the striped *Danaus* form, f. *dissimillima*, were flying and were almost indistinguishable from their models when on the wing, but quite easy to detect when settled.

Pushing through the growth of *Clerodendron* disturbed numbers of *M. visala*, *M. perseus* and *M. leda*, all, of course, of the dry season, unocellated form and all very difficult to spot when settled with their brown, dead-leaf-like underside. The *M. leda* undersides were very varied, as is usual in this species, but with no outstanding forms. *M. leda* is an evening flyer, and both *M. visala* and *M. perseus* appear to prefer shade to sunshine.

A break searching for early stages produced a good variety. A large bush of *Carissa carandas* yielded ova, larvae and pupae of *E. core*, ova and young larvae of *N. didyma*, and larvae of *E. pardalis*, *T. loesa*, this

latter a surprise as I had only found it on Palms before; *E. lunata*, *T. semihyalina*, *A. laetata* and a single *B. suppressaria*. *Ficus* sp. bushes yielded more larvae and pupae of *E. core*, and both larvae and imagines of *O. varians*. A patch of *Heliotropium indicum* produced a large batch of young larvae of *D. obliqua* and a number of single larvae of *U. lotrix* and *U. pulchelloides*, imagines of both the latter being kicked out at the same time.

A large dark butterfly, which, when caught, turned out to be *P. polymnestor*—the only one seen, turned my attention back to the butterflies. Pushing through the *Clerodendron* again I disturbed a couple of specimens of *T. atticus*. This has the unusual habit for a Skipper of resting on the undersides of leaves with its wings outspread like a Geometer. A single female *H. bolina* was seen, and a couple of males, which were probably this species but which may have been *H. misippus*, were seen but not caught. Flying and feeding over the flowers, among the larger insects, were numbers of *C. nerissa*, *P. almana* and *P. atlites*, all, of course, of the dry season form. One or two *P. orithyia* and several *P. lemonias* were basking on patches of sun-baked ground. A single *L. procris* was seen and kept on settling just out of reach, finally flying up into a tree, where it disappeared. Several *N. hylas* and *N. jumbah* were sailing slowly backwards and forwards, usually just out of reach of my net, and settling high up in the Litchi trees with outspread wings. Perseverence, and several carefully aimed stones, resulted in a short series of both species. One attempt ended with a small branch breaking off in my net, and on it I discovered a small larva of *R. amor*. A further search produced a number more and I also found a half-grown Geometer larva that eventually produced a female of *P. ruginaria*.

Another search for larvae among the shrubs and small trees produced a single larva of *S. alternus* and a number of ova of *C. pomona* and *C. crocale* on *Cassia fistula*. The one *Alseodaphne semicarpifolia* gave half-a-dozen small larvae of *C. clytia*, and a Bael the same number of *P. polytes* and *P. demoleus*. Glancing over a bush that I now know to be a *Flacourtia*, my eye was caught by the shine of a speck of metallic silver, and a search provided me with several of the beautiful silver-spotted, green pupae of *A. phalanta* and a number of larvae of varying sizes.

Back to the flowers again with the intention of checking up on the smaller fry, I found numbers of *R. amor*, *S. vulcanus* and *S. ictis* feeding and sunning themselves, the underside ground colour of the latter varying from a pale cream to a deep buff. Numbers of other Lycaenids were flying over the flowers, occasionally settling for a minute or two, and I took specimens of the following:—*C. rosimon*, *T. nara*, *S. plinius*, *N. zalmora*, *A. uranus*, *C. laius*, *E. cnejus*, *E. pandava*, *C. strabo*, *C. boeticus*, *J. bochus*, *J. celeno* and *N. nora*. Except for the two *Jamides*, *celeno* with its almost white upperside and *bochus* with its dark, shining blue, all these Lycaenids are difficult to identify without catching them, and it is quite possible that some species have not been recorded. The Hesperiid was represented by *I. salsala*, *S. gremius*, *U. folus*, *H. adrastus*, *A. pythias* and a single example of *O. gola*. Single specimens of *A. echerius*, *S. epius*, *L. lycaenina* and *R. schistacea* were also caught and a fair number of *T. semihyalina* were feeding and flying in the sun. A single *A. libythea* flew past strongly and then settled on a flower just in front of me and was caught, and several of the beautiful pale blue males

of *V. valeria* flew in and out among the stems. I saw no female of this species. A small dark butterfly, flying with a short zigzag flight in the sunshine, proved to be *S. vulcanus*. Until it was in the net I was almost certain that it was a Skipper of some sort. A flash of brilliant dark blue on a flower a few yards away turned out to be a male of *P. cleobis* and I soon caught some half-dozen specimens, both male and female; this is normally a rare species in Calcutta and the plentiful growth of *Loranthus*, its foodplant, on the Mango trees probably explains its comparative abundance. Single specimens of two other rare Lycaenids, *C. jalindra* and *C. othona*, were also secured.

Another threshing through the thicker growth disturbed a single *E. garuda*, that flew up into a tree, and several specimens of *C. indrani*, another Skipper that rests with outspread wings but, unlike *T. atticus*, on the upperside of leaves in the sun. A pupa of *D. eucharis* was found attached to an upright twig of *Clerodendron*; presumably the larva had fed up on the *Loranthus* high above in the Mango trees. Strangely enough I have never found a larva of *Delias*, although I have found pupae of three species, one in Calcutta and two in the Hills. Several species of moths were also disturbed: *A. caricae*, *F. pallula*, whose larva I have found here commonly in September; *B. chrysolineata* and the beautiful green *G. vertumnalis*. On the outskirts of the patch a number of *E. hecabe* and *Y. hübnéri* were flying with an occasional *E. laeta* and *Y. baldus*, and over a patch of *Oxalis corniculata* growing in the open several *Z. maha* were flying, a search in the *Oxalis* yielding both ova and young larvae of this species.

It was now getting late, the sun was going down behind the trees, and the butterflies had thinned considerably.

Another last look around for larvae produced single larvae of *P. scintillans* and *D. mendosa* off the *Clerodendron*, a number of *D. chrysippus* off *Calotropis procera*, and of *D. limniace* off an Asclepiad creeper. A few half-grown larvae of *G. doson* were found on the young growth of *Polyalthia longifolia*, the velvety black larvae showing up conspicuously against the vivid green of the new leaves. I still had an empty box, so filled it with berries off the *Solanum*, a number of which had small holes encrusted with frass at the side. These on examination at home proved to be inhabited by larvae of *L. orbonalis*.

So ended one of the best afternoon's collecting that I have ever had in Calcutta, or anywhere else for that matter.

The following is a complete list of the species met with:—

RHOPALOCERA.

PAPILIONIDAE.—*Polydorus aristolochiae*, F., *aristolochiae*: *Chilasa clytia*, L., *clytia*, also f. *dissimillima*, Evans: *Papilio polymnestor*, Cr., *polymnestor*: *P. polytes*, L., *romulus*, Cr.: *P. demoleus*, L., *demoleus*: *Graphium nomius*, Esp., *nomius*: *G. doson*, Feld., *eleius*, Fruh.

PIERIDAE.—*Delias eucharis*, Drury: *Cepora* (*Huphina*) *nerissa*, F., *phryne*, F.: *Appias libythea*, F., *olferna*, Swinh.: *Valeria* (*Pareronia*) *valeria*, Cr., *hippia*, F.: *Catopsilia crocale*, Cr., *crocale*: *C. pomona*, F.: *Eurema* (*Terias*) *laeta*, Bsd., *laeta*: *E. hecabe*, L., *contubernalis*, Moore.

DANAIDAE.—*Danaus limniace*, Cr., *mutina*, Fruh.: *D. chrysippus*, L.: *D. plexippus*, L. (*genutia*, Cr.): *Euploea core*, Cr., *core*.

SATYRIDAE.—*Mycalesis perseus*, F., *typhlus*, Fruh.: *M. visala*, Moore,

visala: *Ypthima hübnéri*, Kirby, *hübnéri*: *Y. baldus*, F., *baldus*: *Melanitis leda*, L., *ismene*, Cr.

NYMPHALIDAE.—*Euthalia garuda*, Moore, *suddhodana*, Fruh.: *Limnitis procris*, Cr., *procris*: *Neptis jumbah*, Moore, *jumbah*: *N. hylas*, L., *varmona*, Moore: *Hypolimnias bolina*, L.: *Precis orithya*, L., *swinhoei*, Btlr.: *P. lemonias*, L., *vaisya*, Fruh.: *P. almana*, L., *almana*: *P. atlites*, L.: *Atella phalanta*, Drury.

ERYCINIDAE.—*Abisara echerius*, Stoll., *suffusa*, Moore.

LYCAENIDAE.—*Spalgis epius*, Westw., *epius*: *Castalius rosimon*, F., *rosimon*: *Tarucus nara*, Koll.: *Syntarucus plinius*, F.: *Azanus uranus*, Btlr.: *Neopithecops zalmora*, Btlr.: *Chilades laius*, Cr., *laius*: *Zizeeria maha*, Koll., *maha*: *Euchrysops cnejus*, F.: *E. pandava*, Hors., *pandava*: *Lycaenesthes lycaenina*, Feld., *lycaenina*: *Cosmolyce (Lampides) boeticus*, L.: *Jamides bochus*, Cr., *bochus*: *J. celeno*, Cr., *celeno*: *Nacaduba nora*, Feld., *nora*: *Spindasis vulcanus*, F., *vulcanus*: *S. ictis*, Hew., *ictis*: *Pratapa cleobis*, Godt.: *Charana jalindra*, Hors., *indra*, Moore: *Rathinda amor*, F.: *Chliaria othona*, Hew.: *Rapala schistacea*, Moore.

HESPERIIDAE.—*Tagiades atticus*, F., *khasiana*, Moore: *Coladenia indrani*, Moore, *indra*, Evans: *Iambrix salsala*, Moore, *salsala*: *Suastus gremius*, F., *gremius*: *Udaspes folus*, Cr.: *Hyarotis adrastus*, Cr., *praba*, Moore: *Oriens gola*, Moore, *gola*: *Astycus pythias*, Mab., *bambusae*, Moore.

HETEROCERA.

BOMBYCIDAE.—*Ocinara varians*, Wlk.

SPHINGIDAE.—*Nephele didyma*, F.

NOTODONTIDAE.—*Stauropus alternus*, Wlk.

ZYGAENIDAE.—*Trypanophora semihyalina*, Koll.

LIMACODIDAE.—*Thosea loesa*, Moore.

LASIOCAMPIDAE.—*Estigena pardalis*, Wlk.

LYMANTRIIDAE.—*Dasychira mendosa*, Hbn.: *Euproctis lunata*, Wlk.: *Porthesia (Euproctis) scintillans*, Wlk.

ARCTIIDAE.—*Asota caricae*, Bsd (*Hypsa alciphron*, Cr.): *Diacrisia obliqua*, Wlk.: *Utetheisa lotrix*, Cr.: *U. pulchelloides*, Hamps., *vaga*, Jord.

NOCTUIDAE.—*Fodina pallula*, Guen.

GEOMETRIDAE.—*Buzura suppressaria*, Guen.: *Pingasa ruginaria*, Guen.: *Agathia laetata*, F.: *Berta chrysolineata*, Wlk.

PYRALIDAE.—*Glyphodes vertumnalis*, Guen.: *Leucinodes orbonalis*, Guen.

This makes a total of 65 species of Rhopalocera. De Nicéville, in a list published in 1885, recorded 135 species as occurring in Calcutta, whilst Saunders (1944) records a total of 120, excluding the HesperIIDae.

For the sake of comparison the following figures may be interesting. Fairly systematic collecting at Tukdah, a small place in the Darjeeling Hills at an altitude of 5000 feet, produced 94 species of butterflies during May and June 1944. A fortnight's collecting at Peshoke, also near Darjeeling but only about 2500 feet high, at the end of December 1936 produced 71 species only. It will be seen from this that Calcutta, at the proper season and in the proper locality, can be as productive as anywhere.

BRITISH MICROPEZIDAE (DIPTERA).

By J. E. COLLIN, F.R.E.S.

In the following account the genus *Tanypeza*, Flin., originally included in this family, but subsequently removed by Hendel, first to the Ortalidae (as a distinct subfamily), and then considered to represent a distinct family near the Micropezidae, is replaced in the Micropezidae, as representing a subfamily. I agree with Hennig (1936, *Deuts. Ent. Zeitschr.*, 28-31) that the male genitalia do not conform to the very distinctive genital characters of the group of families in which the Ortalidae are included, but show a marked agreement with the Micropezid type of genitalia, especially with some Neriinae and Taeniapterinae. In view of this and other marked resemblances to the Micropezidae, it appears a more natural arrangement to include *Tanypeza* as representing a subfamily of the Micropezidae.

Flies of this family may be recognized by their narrow shape, and often very elongate, slender, legs. There is no "break" in costa of wings either near humeral cross-vein, or at end of first (mediastinal) vein, and the subapical cell is narrowed at tip of wing. Face without vibrissae, and occiput often strongly projecting backwards behind eyes. Tibiae without preapical bristles.

The species are to be found among herbage, and on leaves of bushes, occasionally on fallen tree-trunks. They seldom fly and many have a peculiar way of walking described by Fallén as "arroganter ambulare solent." Nothing is known of the life-history of any British species, but there are records of exotic species breeding in decaying vegetable matter and rotten wood.

There are four British genera, so very distinct that they are considered to represent four different subfamilies, while the six British species of one genus (*Calobata*) have been divided among five separate subgeneric names. When it is found, however, that some characters used for these proposed subgenera are variable (e.g., number of dorso-central bristles in *petronella*), or are those of varying degrees of length (palpi and wing "stigma"), or are confined to one sex, or occur in other (so-called) subgenera in different combinations, it is very doubtful whether they are of greater than specific value. The proposed subgenera are therefore indicated (in brackets) but not adopted.

The generic names *Tylos*, Mg. (1800), and *Trepidaria*, Mg. (1800), have recently been suggested as earlier names for *Micropeza* and *Calobata* respectively, but the fact that it is impossible to recognize any one of the four originally included un-named species (stated by Meigen to have been European species known to him in nature) was accepted by all Dipterists for more than 100 years, and is still entirely correct. Under Opinion 46 when such recognition is impossible the generic names represent *genera dubia* and cannot be used.

The following tables and notes should make the identification of the ten British species possible.

Table of Subfamilies and Genera.

- 1 (6). Upper half of occiput prominent and never decidedly concave.
Vein closing anal cell not semicircularly convex exteriorly.

Pteropleurae bare. Only one postalar bristle. Only two scutellar bristles.

- 2 (3). No crossvein separating second basal and discal cells of wing. Costa practically bare from base to end of subcostal vein, this subcostal vein (R_1) with small bristles on upper surface. One distinct, strong, sternopleural bristle. Occiput very prominent and postvertical bristles present. No ventral pregenital lobes in males of British species and no thoracic dorso-central bristles. At least four posterior tibiae with small bristles.

MICROPEZINAE—MICROPEZA, Mg.

- 3 (2). Crossvein present between second basal and discal cells. Costa setulose to base. One—two (or even three) pairs of dorso-central bristles. Usually no single strong sternopleural bristle though often a fan of finer bristly hairs. Males with ventral abdominal lobes.

- 4 (5). Postvertical bristles present. Clypeus strongly developed and projecting, shining black. Arista bare. Subcostal vein with a few tiny bristles on upper surface about base. Tibiae with small bristles. Remarkably distinct, large, black, species, with dark bands on wings, and legs mainly black, with (in strong contrast) first 2-3 joints of front, and first joint of hind, tarsi, whitish-yellow.

TAENIAPTERINAE—RAINERIA, Rdi.

- 5 (4). Postvertical bristles absent. Clypeus almost hidden in mouth-opening. Arista distinctly pubescent or subplumose. Subcostal vein bare. Tibiae without small bristles, clothed only with fine hairs. Usually greyish species with yellow legs and no bands on wings.

CALOBATINAE—CALOBATA, Mg.

- 6 (1). Upper half of occiput very concave, with narrow postocular orbits. Vein closing anal cell strongly convex exteriorly. *Pteropleurae* hairy. Subcostal vein obviously setose. Postvertical and humeral bristles present. Two postalar bristles. Four scutellar bristles.

TANYPEZINAE—TANYPEZA, Flh.

MICROPEZA, Meigen.

Table of British Species.

- 1 (2). Smaller, mainly black species. Vertex and occiput black. Thorax practically entirely black. Male hypopygium mainly black.

5-6.5 mm. (Female the larger.) Hindmargin of abdominal segments only obscurely yellowish. Venter darkened. Four posterior coxae somewhat darkened. Hind femora with only a few minute hairs behind about base.

Widely distributed but not common. *corrigiolata*, L.

- 2 (1). Larger, black and yellow species. Vertex and occiput streaked and spotted with yellow. Sidemargins of thoracic disc, and lower part of pleurae, yellow. Male hypopygium mainly yellow.

6-8.5 mm. (Female the larger.) Disc of thorax with three broad (confluent or almost confluent) dark stripes, side ones abbreviated in front. Venter and hindmargin of abdominal tergites obviously yellow. All coxae yellow. Hind femora of male distinctly hairy behind about base.

Locally common. I have records from Surrey, Suffolk, and Culbin Sands near Forres (Scotland), where it was common in July 1933 and August 1935.

lateralis, Mg.

RAINERIA, Rondani.

R. calceata, Fln., is a very distinct species first captured in this country by Mr H. Donisthorpe in Windsor Forest in June and July 1930, when specimens were found on a large felled beech-tree (v. *Ent. Month. Mag.*, lxvi, 260).

CALOBATA, Meigen.

Table of British Species.

- 1 (6). Mediastinal and subcostal veins (first two veins in wing) ending very close together in costa (as in *Micropeza*), or distance along lower margin of costa between ends of these veins, at most, very little longer than middle crossvein.
- 2 (3). Mediastinal and subcostal veins as in *Micropeza*. Small species with short and narrow wings, mainly yellow thorax (black on front margin and scutellum) and often two dark annulations on hind femora. Whole of prothoracic episterna with hairs as well as pile. Palpi not quite extending to front of mouth opening (*Paracalobata*, Hend.).

4-5 mm. Arista only slightly pubescent about base. Whole of occiput, and frons except in front, black. Prothorax, and lower and posterior part of pleurae, black. Male ventral lobes consisting of a tubular projection from each side of fourth sternite, pointing towards rear, and sharply bent towards each other at their tips, which are dilated into rounded knobs.

I have found this species in damp ditches in marshy places in Suffolk, Cambs., and Oxfordshire, in May and June.

- 3 (2). Mediastinal and subcostal veins ending slightly further apart. Much larger species with longer and rather broader wings, and thorax dark but dusted greyish. Palpi very short. Prothoracic episterna with a few hairs only on lower margin above front coxae. Only one pair of dorsocentral bristles on thorax. (*Compsobata*, Cz., and *Trilophyrobata*, Hennig).
- 4 (5). Arista entirely pale yellow. Upper half of frons at least somewhat darkened. Male ventral lobes of fifth sternite curved towards each other and semitubular but dilated knob-like at tip, they are preceded by a median flat ventral projection.* Anal "cerci" with not very long hairs. Female ovipositor without a transverse row of long hairs at tip beneath.

5-7 mm. Very much like the next species but apparently less common.

**Trilophyrobata*, Hennig, of which *C. commutata*, Cz., was designated as type, was stated to be founded upon this character, and the presence of a more or less evident thorn-like projection on each side of base of female ovipositor. The second character is quite indistinguishable in British specimens, and appears to apply chiefly to the American species, *C. pallipes*, Say.

Has been taken in Brecknockshire, Suffolk, Westmorland, and various localities in Perthshire, in May and June. *commutata*, Cz. (*cothurnata*, Auct. nec Pnz.).

- 5 (4). Arista darkened about base. Upper half of frons yellow even on each side of ocellar triangle. Male ventral lobes similarly curved towards each other as in *commutata*, but each one much wider, especially about base, though abruptly narrowed near tip, where they are flattened out into an anterior rounded dilation and a smaller more pointed posterior tooth; they are not preceded by a median ventral projection. Anal cerci with much longer hairs, longer than cerci. Female ovipositor with a transverse row of long pale hairs at tip beneath.

5-7.5 mm. One of the commonest British species from Sussex and Devon in the South to Edinburgh in the North. Loew described this species under the name *trivialis*.

cibaria, L. (*cothurnata*, Pnz.).

- 6 (1). Ends of mediastinal and subcostal veins separated on costa by a space several times (at least more than twice) the length of middle crossvein. Palpi always visible, as long as mouth opening.

- 7 (8). Usually two pairs of dorsocentral bristles on thorax. Humeri and female ovipositor yellowish. Arista with very short pubescence. Thorax without shining black stripes. Prothoracic episterna bare except on ridge above front coxae. Anal vein extended to wing margin. Male without a ventral projection between hind coxae. (*Calobata*, sensu stricto.)

5-7.5 mm. Each lobe of fifth abdominal sternite in male bidentate, with a short inner, and long tubular outer, projection, curving towards base of abdomen; there is also a smaller tubular projection from each side margin of fourth sternite, and a still smaller one from each side margin of third sternite, all of which curve towards the rear.

This species is not uncommon in Scotland as far north as Golspie (Sutherland), but I can also record it from Hampshire and Suffolk. *petronella*, L.

- 8 (7). Only one pair of dorsocentral bristles. If humeri and female ovipositor yellowish, arista bearing long pubescence, and whole of prothoracic episterna bearing hairs as well as microscopic pile. Anal vein abbreviated. Male with a projection of metasternum towards the rear, between hind coxae. (*Cnodacophora*, Cz.)

- 9 (10). Thorax entirely covered with greyish dust. Larger species. Second antennal joint blackish. Prothoracic episterna hairy.

6-8 mm. In mature specimens the costal area from end of radial vein to tip of wing is infuscated. Ventral lobes of male abdomen curving forwards towards base of abdomen somewhat as those on fifth sternite in *petronella*, but simple not bidentate; they appear to arise from beneath sides of fourth tergite, but are really part of fifth sternite.

This species is not uncommon in the South (Brecknockshire, Herefordshire, Cambs., and Suffolk) but I have no records north of Derbyshire.

sellata, Mg. (*adusta*, Lw.)

NOTE.—*C. sellata* was described from an English female. Becker reported in 1902 that the type in Meigen's Collection was in poor condition, without abdomen or tarsi, and stated that he considered it to be a light coloured specimen of *cibaria*, L. This identification has always appeared doubtful owing to Meigen's description of "Taster weiszgelb; Fühler gelb mit schwarzer Wurzel" coupled with dark humeri. The only British species with these characters is that hitherto known as *adusta*, Lw. Our British *cibaria* has yellow palpi, which are short and usually so concealed that it is most improbable Meigen would have described them, and though the second antennal joint may sometimes be a darker yellow than the third it is never blackish. Thanks to the kind co-operation of Mons. E. Seguy of the Paris Museum I have learned that the venation of the type specimen agrees with the couplet 6 (1) above, and as the humeri of *sellata* were described as "schwarz" there can be little doubt that the above synonymy is correct.

10 (9). Thorax with polished black stripes or patches. Smaller species. Second antennal joint yellow. Prothoracic episterna without hairs except on ridge above base of front coxae.

4.5-6 mm. An easily recognized species. Frons with upper half black. Shining black areas on thorax include a patch at middle in front, and two side stripes abbreviated both in front and behind. A broad grey-dusted middle stripe divides into two diverging narrow stripes in front which extend to each humerus, and widens out behind to cover the postalar calli and scutellum. The abdominal lobes in male arising from fifth sternite are similar to those of *sellata* and are situated at about half way down abdomen. Female ovipositor also resembling that of *sellata* in being more tapering in outline than in *cibaria* or *cothurnata*.

Known only from Scotland where it is not uncommon in the Spey Valley (Inverness-shire) in June and July.
stylifera, Lw.

TANYPEZA, Fallén.

T. longimana, Flin. A black species with a silvery patch on vertex and each side of front of frons. Thorax with notopleural depression silvery, and pleurae with silvery patches. Palpi black, prominent and flat. Ocellar bristles small; two pairs of front-orbital bristles; only one (outer) pair of vertical bristles. Frons slightly narrower in male than in female, but *not* with eyes almost touching as stated by Hendel. Four scutellar, no sternopleural, two postalar, and one supra-alar, bristles; the anterior supra-alar bristle mentioned by Hendel *not* present. Wings with upcurved discal vein as in other members of the family.

About 6 mm. Apparently rare. I possess two specimens, both from Suffolk, the male recorded by Bloomfield (*Ent. Mo. Mag.*, 1904, p. 60), and a female taken by Col. C. G. Nurse at West Stow on 26th July 1913.

The ANNUAL EXHIBITION of the S. London Entomological Society will be held at Burlington House, Piccadilly, London, W.1., on October 27, from 1.30 to 5 p.m.

COLLECTING NOTE.

DIPTERA IN NOVEMBER.—It is seldom that captures of Diptera are recorded beyond September or October, but the unexpected results of a day's collecting in November, although most of the species were common ones, has shown me that, given favourable weather conditions, quite a number of species can still be taken after the close of what may be termed the normal out-of-doors collecting season.

The 4th November 1944 was one of the few really fine Saturdays of that year: warm, sunny, and windless, and I went to Farmingham Woods (Kent) to see if the usual hibernating Trypetids were present, especially *Tephritis hyoscyami*, L., one specimen of which I had swept in the same locality some years back, in March. Actually I did not get that fly, but kept on picking up other Diptera, by sweeping the heather, of which there is a fair-sized patch inside the woods; examining tree trunks; and sweeping the lower branches of the scattered yew trees that are to be found in these woods. When I got home I found that I had taken 21 different species, as shown in the following list:—

Trichocera saltator, Harr.; *Mycetophila fungorum*, Deg.; *Campsicnemus curvipes*, Fall.; *Bucentes maculata*, Staeg.; *Calliphora vomitoria*, L.; *Cryptolucilia caesarion*, Mg.; *Enoplopteryx ciliatocosta*, Ztt.; *Scatophaga decipiens*, Hal.; *Helomyza humilis*, Mg.; *H. variegata*, Lw.; *H. notata*, Mg., var. *hilaris*, Ztt.; *H. affinis*, Mg.; *Tephrochlamys laeta*, Mg.; *Neoleria ruficanda*, Ztt.; *Dryomyza flaveola*, Fab.; *Elgiva dorsalis*, Fab.; *Tephritis bardanae*, Schr.; *T. conjuncta*, Lw.; *T. vespertina*, Lw.; *Sepsis cynipsea*, L.; *Copromyza hirtipes*, R.D.—H. W. ANDREWS, F.R.E.S.

CURRENT NOTE.

THE American magazine, *Entomological News*, each month, has a "Current Entomological Literature" column, which usually contains something off the general lines of biological record. In March, the subject discussed was the "dependence of colour changes, moulting and metamorphosis on the hormones." In April the subject was a consideration of the bacterial symbionts, which live inside the cells of the bodies of insects. In May the subject was a book on Evolution, looked at from a fresh point of view and dealing with population genetics. In June the account is given of the action of DDT. in the eradication of the great vector of typhus in Naples, the louse. "The white DDT. powder was applied directly by compressed air guns, which swashed it up trousers and shirts, down sleeves, into collars, seams, tucks and folds wherever the insect or its eggs might cling. More than 1,300,000 were treated." The epidemic collapsed with astonishing rapidity. In the July number notes are given of the results of a census of the years of life of entomologists, 2187 in number born between the years 372 B.C. and 1920. The average age for the entire number was 65.48. The largest number of deaths occurred in the age group 70 to 74. Only 30 per cent. died under 60; 23 per cent. between 60 and 69; 29 per cent. between 70 and 79; 18 per cent. between 80 and 94. Other interesting statistics are given in the Note. Karl Pearson's opinion was that longevity was a matter of heredity. [It is so in my case for three generations. Males.—HY. J. T.]

race *variegata*, Aust., *Le Nat.*, VII, 142 (1835).

ORIG. DESCRIP.—“ They resemble *splendens* in the neatness of all the lines which cross the forewings; but while *splendens* is of a somewhat bright reddish-brown, my Moroccan specimens, on the contrary are of a pale chocolate brown. This same tint also separates them from *oleracea* which is always of a ferruginous brown. This last species has also the usual lines always obliterated, except the terminal one, which is white, straight except for a letter M in its middle. This species [*variegata*] has this line which is also common to *splendens*; but instead of being quite straight it is a little sinuate in its lower portion. The lower wings are clearer than in the two species mentioned, and the brown marginal band which runs around them is narrower and better defined.” Morocco.

Hamp., *Cat. Lep. Ph.*, V, 136 (1905). “ Much paler.”—Morocco.

var. *variegata*, Aust., *Obthr.*, *Lép. comp.*, XVI, 154 (1920).

“ Seitz is far from giving an exact idea of this Noctuid.” “ Instead of being coloured a vinous red tint characteristic of the African *variegata*, the figure of Seitz is of a yellow ochre.” But the description says the Morocco form “ is a brighter reddish-yellow.”

subsp. *variegata*, Aust. [*Roth.*, *Nov. Zool.*, XXVII, 58 (1920)]. “ The Mauretanian race is vinous maroon rather than reddish-ochraceous.”

ab. *obscura*, Splr., *Schmet. Eur.*, I, 170 (1907).

ORIG. DESCRIP.—“ The ground tone of colour is in the type deep red-brown (as are the Scandinavian examples which Linné of a certainty had before him) and varies from this to blackish red-brown.” ab. *obscura*, m.

ab. *brunneomaculata*, Heinz., *Deut. ent. Zt.* (1916), 515?

“ The yellow centre of the reniform forewing upperside is suffused with brown.” Papenberge near Berlin.

ab. *minor*, Cabeau, *Lamb*, XXXII, 81 (1932).

ORIG. DESCRIP.—“ Typical but very small, 32 mm.” Framières, Belgium.

ab. *nana*, Cabeau, *l.c.*

ORIG. DESCRIP.—“ Similar in size to ab. *minor*, but with the coloration of ab. *obscura*, Spul.” Framières, Belgium.

ab. *minuscule*, Cabeau, *l.c.*

ORIG. DESCRIP.—“ Similar to ab. *minor*, but in coloration as in *obsoleta*, Lamb.” Framières.

ab. *obsoleta*, Lamb. [Reference not given.]

DESCRIP.—[See Drdt.-Stz., *Pal. Noct. Supp.*, III, 100 (1931)].

“ Denotes specimens with extinct reniform stigma.”

f. *pallida*, B. Salz., *Ent. Record* (1937), Supp. (6).

ORIG. DESCRIP.—“ It may be called a light *variegata*, Aust. One specimen agrees well with my light *variegata* from Tunis. The others form a continuous transition to the following lighter pale reddish

form. Orbicular and reniform light yellowish submarginal line broad white. H.w. light grey only a little darker at the margin. Underside uniform light grey without markings, only traces of the discal spot present." Keredj. 1400 m.

Hadena, Ochs. & Tr. (1816-25), Steph., Gn., Tutt: [*Agrotis*, Ochs. & Tr. (1816-25), Meyr.: *Polia*, Ochs. & Tr. (1816-25), Hamps., Warr.-Stz., Drt.-Stz.: *Melanchra*, Hb. (1820), Meyr.: *Mamestra*, Hb. (1821), Stdgr., Splr., Sth., Culot] *pisi*, L. (1758).

Tutt, *Brit. Noct.*, III, 89 (1892): Meyr., *Handb.*, 88 (1895): Barr., *Lep. Br. I.*, IV, 183, plt. 152, 2 (1897): Stdgr., *Cat.*, IIIed., 157 (1901): Splr., *Schm. Eur.*, I, 172, plt. 56, 17 (1905): Hamp., *Lep. Phal.*, V, 136, f. 25 (1905): South, *M.B.I.*, I, 244, plt. 127, 1-2 (1907): Warr.-Stz., *Pal. Noct.*, III, 73, plt. 17b, c (1909): Culot, *N. et G.*, I (1), 103, plt. 17, 11-12 (1911): Meyr., *Rev. Handb.*, 156 (1928): Drdt.-Stz., *Pal. Noct. Supp.*, III, 100, plt. 14f (1931).

Esper, *Abbild. Schm. Noct.*, IV, 600, 4-6 (1788+?) gave two fairly good figures. 4a ♂ a uniform dark colour, with a very distinct submarginal; fig. 5 a much variegated form with whitish marking, ♀; fig. 6 named *tricomma* is probably an aberration of *pisi*.

Ernst & Engr., *Pap. d'Eur.*, VII, 98, f. 477c, d, e, f, g (1791), gave 5 very good figures, comprising the range of usual variation.

Hb., *Samml. Noct.*, 429 (1808-9), gave an excellent figure of a typical form.

Haw., *Lep. Brit.*, 193 (1809), cited Hb. 429. He reported a single example of a variety, "Alis anticis fuscis striga postica interrupta alba: posticis cinereis puncto lunari medio fimbriaque fuscis, et in fimbria fascia abbreviata albicante."

Dup., *Hist. Nat. Noct.*, VII (1), 17, plt. 101, 5 (1827), gave an excellent figure of the plainer form.

Steph., *Ill.*, II, 192 (1829), described a single specimen from Cumberland as agreeing with the *splendens*, Tr. Tutt said that it was the var. A. of Haw.

Gn., *Hist. Nat.*, VI, 102 (1852), dealt with 3 forms. A. has obliteration of the lines and spots more or less complete except that the subterminal remains almost perfect. He indicates an example from N. America and refers to Esp., *Abbild. l.c.*, 107, fig. 4. B. has its ground colour ochraceous white, the subterminal white, markings present but very light, and hindwings very pale. C. he called *splendens*, for which he cited Stephens, *Ill.*, III, p. 192. It has a red-brown ground with markings very dull and with the subterminal line almost effaced except at the anal angle. England.

Barrett, *l.c.* (1897), plt. 157, gave five figures of average examples. 2c, has the submarginal line very strongly developed and has a similarly well-marked submarginal line on the hindwings; 2d, is described as "a very pretty pale purple-grey mottled with brown and black markings," but the figure hardly satisfies the description.

Stdgr., *Cat.*, IIIed., 159 (1901), recorded *rukavaarae* and *pallens* forms.

Hamp., *Lep. Ph.*, V, 136, f. 25 (1905), cited *splendens*, Steph., England; *pallens*, Stdgr., Iceland, Turkestan; and *ruk(c)avaarae*, Hoffm., Finland, E. Siberia.

Splr., *Schm. Eur.*, I, 172, plt. 36, 17 (1905), gave a very good figure of a typical form. He recorded ab. *splendens*, Steph., ab. *pallens*, Stdgr., ab. *rukavaarae*, Hoffm., and f. *kormuzaki*, Rothke, for a second generation (August). [I cannot trace this last form (Hy. J. T.)]

South, *M.B.I.*, I, 244, plt. 122, 1-2 (1907), gave 2 good figures, a variegated form and a darker more obscurely marked form.

Warr.-Stz., *Pal. Noct.*, III, 73, plt. 17b, c (1909), gave 5 figures rather poor in colour and not variegated sufficiently to bring out the characters of the insect. They recognize ab. *splendens*, Steph., ab. *rufa*, Tutt, ab. *pallens*, Stdgr. (*pallida*, Tutt)?, ab. *scotica*, Tutt, and ab. *suffusa*, Tutt.

Culot, *N. et G.*, V (1), 203, plt. 17, 11-12 (1911), gave 2 very good figures; a very varied form and another more uniform specimen with the yellow outer marginal line well emphasized.

Drdt.-Seitz, *Pal. Noct. Supp.*, III, 100 (1931), record f. *aestiva*, darker brown-red, *saltdalensis*, monotonously marked, from Norway, and ssp. *nyiwonis*, Mats., from Saghalin. They also say that *rukavaarae* is not identical with *scotica*, and on plt 14f a cotype is figured.

Of the Variation Barrett wrote:—

“Very variable in tone of colouring, from the brightest richest purple-red, to dull clay colour and very much paler shades, or tinged with brown or yellow or even with dark grey; also quite uncertain in the degree of mottling, which indeed sometimes wholly disappears, leaving the forewings of a smooth even purple-brown or purple-red, darker or paler when also all the markings are even less distinct, except the subterminal line which is nearly always conspicuous and usually of a lovely yellow. A series of such specimens of unusual richness is in the collection of Mr W. H. B. Fletcher. In Mr F. J. Hanbury’s collection is a specimen of a dull dark purplish-red without a trace of any of the pale markings. In Ireland the range of colouring appears to be even greater than with us—red, red-brown, purple-red, even brown and ashy-brown in various tones, purple-grey, or purple-slate; and Mr Kane records one specimen from the bog of Allan having the dark red-brown colour of *Eurois adusta*. In the West of Scotland many specimens are tinged with greyish-blue. Mr P. M. Bright has one from the east of that country of a very pretty pale purple-grey mottled with brown and black markings; and two others of a bright clay-red totally devoid of markings, except the subterminal line, which is very broad and conspicuous.”

The Names and Species to be considered:—

- pisi*, L. (1758), *Syst. Nat.*, Xed., 517, cf. *Fn. S.* (1761).
- ab. *tricomma*, Esp., *Abbild. Noct.*, IV (1), 600, plt. 167, 4-6 (Syn.?) (1794).
- ab. *splendens*, Steph. (1829), *Ill.*, 111, 192.
- ab. *pallens*, Stdgr. (1882), *Stett. e. Zeitg.*, 43, 35.
- (ab. *pallida*, Tutt. (1892), *Brit. Noct.*, III, 91). Syn.?
- ab. *rufa*, Tutt, *l.c.*, 91.
- ab. *scotica*, Tutt, *l.c.*, 92.
- ab. *distincta-rufa*, Tutt, *l.c.*, 92.

ab. *distincta-scotica*, Tutt, l.c., 92.

ab. *suffusa*, Tutt, l.c., 92.

r. *rukavaarae*, Hoffm. (1893), *Stett. e. Ztg.*, 127.

f. *aestiva*, Rothke (1902), *Insect. Börse.*, **19**, 164.

r. *saltdalensis*, Strand. (1903), *Arch. Math. Natur.*, V, **25**, No. 9, p. 11.

ab. *nyiwonis*, Mats. (1924-5), *Jnrl. Coll. Agri. Supporo.*, XV, III, 133.

ab. *striata*, Cockayne (1939), *Ent. Rec.*, **51**, 8.

Tutt dealt with: (1) The typical form red-brown, mottled with grey, markings distinct. (2) Red-brown, almost unicolorous except the subterminal, ab. *splendens*, Steph. (3) Bright red markings obsolete, except subterminal; ab. *rufa*. (4) Bright red, sometimes strongly tinged with ochreous, markings distinct; ab. *distincta-rufa*. (5) Pale grey, with a reddish tinge, markings distinct; ab. *pallida*. (6) Purplish-red or -brown, markings distinct; ab. *distincta-scotica*. (7) Purplish-red or -brown, markings obsolete, except subterminal; subsp. *scotica*. (8) Suffused blackish; ab. *suffusa*.

ab. *tricomma*, Esp., *Abbild.*, IV, 1 (2), 600 (1791+).

FIGS.—Plt. 167, f. 6

DESCRIP.—All trace of the light white or whitish markings completely absent, even a trace of the submarginal is absent. Wernebg. said it was *baia*.

race *pallens*, Stdgr., *Stett. e. Zeitg.*, **43**, 35 (1882).

ORIG. DESCRIP.—“From Lepsa, Central Asia, I obtained 22 examples, almost quite alike, and yet so very different from *M. pisi*, that I at first took them for another species. The forewings are almost uniform pale yellow-brown (rarely with a trace of reddish); only the white outer marginal line with the large white spot on the inner angle stands out very strongly. The transverse lines are almost wholly wanting; the stigmata are very faintly marked; on the other hand the veins towards the exterior are often suffused with black. But the hindwing and undersides are lighter, the latter towards the costa are faintly tinged with reddish. Head and thorax are also pale yellow-brown, not red-brown. The Iceland *pisi* comes very near this var. *pallens* and forms an intergrade to it; one Iceland example agrees almost exactly with the central Asian one. It is remarkable to find a form in Central Asia and a local form as from Iceland so much alike.” Hamp., *Cat. Lep. Ph.*, V, 136 (1905), said: “Forewing pale brown with a yellowish tinge, the markings less prominent.”—Iceland; W. Turkestan.

race *rukavaarae*, Hoffm., *Stett. e. Zg.*, p. 127 (1893).

ORIG. DESCRIP.—“The small strongly aberrant form of *M. pisi*, which I caught at sugar in the beginning of July appears to be very constant in North Finland; the smallest I obtained from a larva which I met with in S. Finland, an insect not aberrant from the usual form, only somewhat darker.

Var. *rukavaarae* has an expanse of only 25-33 mm., compared with 35-40 mm. of my collection specimens of *M. pisi*. The dark red-brown ground colour becomes almost completely obscured by a blackish and pale grey suffusion. All the markings indistinct and obsolescent, the otherwise so sharply prominent yellowish-white waved line is mostly obsolete, right up to the spot on the inner angle of the cell 1b, which stands out

EXCHANGES.

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Wanted for cash or exchange many species of ova, larvae and pupae, including *A. grossulariata* larvae in large numbers. Offers also Tutt's *British Lepidoptera*, vols. 1, 2 and 3; Barrett (small edition), vols. 3, 4, 5 and 6; Tutt's *British Noctua and their Varieties*, vols. 2, 3 and 4.—Pickard, 36 Storeys Way, Cambridge.

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Wanted—Males of *Morpha menelaus*, *M. didius*, *M. rhetenor* in papers.—Leonard Tatchell, Rockleigh Cottage, Swanage, Dorset.

Wanted urgently for experimental purposes, pupae of *betularia*, *porcellus* *elephanor*.—Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.

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Wanted—*Geometres de Europe*, by Jules Culoz (2 Vols.), bound or in parts.—Brig.-Genl. B. H. Cooke, C.M.G., C.B.E., D.S.O., F.R.E.S., 88 Osborne Road, Windsor.

Desiderata—*A. alpicola* (*alpina*), *H. crinanensis*. **Duplicates**—Many species *Noctuæ* and abs.; or cash.—A. J. Wightman, "Aurago," Pulborough, Sussex.

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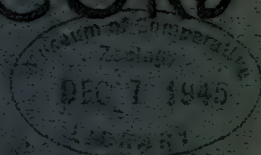
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Late on the evening of 5th September I had a look inside the moth-trap (through a side door provided) and saw, resting at the bottom of the compartment below the glass partition, a moth I couldn't name—a *Luperina* seemed to be suggested, but I could not see a var. of *testacea* being the answer to my query. I went downstairs and looked up South

and, a little wiser, returned to make sure of the prize I felt certain I had taken by getting it safely boxed. As soon as I heard Mr Sutton about the following morning I confronted him with my capture, which he said at once he felt sure was *Luperina dumerilii*, Dup. Since his return to Birmingham he has compared my capture with the insect in the collection of the late Mr G. W. Wynn (whose identification was confirmed by Mr Tams in 1936) and, as anticipated, found them practically identical. I looked up both Seitz and Barrett at the Torquay Museum and found nothing to suggest the possibility of any mistake. Dr Cockayne and Mr P. P. Milman, to both of whom I sent a rough sketch of the upper wing enlarged to show all details, are also sure we are right. It is a good specimen, resembling the figure in Seitz rather than that in Newman's Moths. The reniform shown as such by the latter gives place to a roughly rectangular area almost uniformly light straw colour, appearing nearly white against the adjacent dark areas which, to me, give a banded appearance to the wings in spite of the very striking nearly white " rays " that pass across them. My specimen is a male.

I think it will suffice for the present announcement if I just add that after *L. dumerilii* the best migrant September has brought to Maidencombe has been *Leucania vitellina* (one at sugar, two in the moth-trap) and that there is a not unexciting story of *Herse convolvuli* yet to be told.

" The Gables," Maidencombe, S. Devon.

NOTES FROM THE ISLE OF WIGHT.

By J. W. SAUNT, A.L.S.

HYLOICUS PINASTRI, L., at East Cowes. I was greatly surprised to receive an example of this species from Mr Cannon on 17th July, taken on a neighbouring house; so far I have been unable to trace any previous record for the island. Morey, *Guide to the Natural History of the Isle of Wight*, makes no mention of this species. Mr Jeffery tells me he has not heard of it being taken on the island before.

HERSE (SPHINX) CONVULVULI, L. On 30th August Mr Woodford brought me an example of this species from Ryde; curiously enough, he did the same last year. On 4th September Mr Landon brought one from Northwood, which his cat had caught the night before about 10 p.m.; unfortunately, it had hardly a scale left on its body. Two days later the same thing occurred, and the same afternoon one was taken at rest in the shipyard and brought to me. Five days later that feline entomologist did the same thing again; not content with that, in the next few evenings it caught two more, making five in all. Here are definitely seven records for 1945 and I suspect from what I have heard that another was taken in a greenhouse in E. Cowes. It is disappointing to add that among all these examples there was not one really good cabinet specimen. Only one ovum was produced, and this appears to be unfertile. In the autumn of 1941 a gardener brought me a full-grown larva. This soon pupated, but unfortunately in the blitz the following May it, along with many other things, vanished.

PAPILIO MACHAON, L. Considering the comparatively few recent records of this species in the island I think it desirable to place on record that Mr Wakely of Gurnard brought me a larva found feeding on the tops of garden carrot, and about the same time five examples were recorded in the I.O.W. County Press from two other districts on the island; these also were feeding on garden carrots. My example pupated three days afterwards.

I have only seen one *Colias croceus*, Frery. (*edusa*, F.) and two *Vanessa cardui*, L., this year, but *Plusia gamma*, L., and *Nomophila noctuella*, Sch., have been about in their usual numbers. There was a huge immigration of *Pieris brassicae*, L.; I don't remember ever seeing such destruction to cabbages by their larvae as in the present year.

STAUROPUS FAGI, L. The peculiar-looking larva of the "Lobster Moth" was brought in to me from Totland by Mrs Toogood, on whose hat it fell while passing beneath an Elm tree on 10th September.

DRAGONFLIES. Although *Anax imperator* has been recorded in Morey's *Guide* as "rare," I had never seen it myself until this year, when it occurred about twenty times at E. Cowes and Kingston, but in spite of much patient waiting it always kept well over the pools out of reach and most diligent search in the evenings failed to locate its resting place. One was picked up dead in the shipyard, another caused some excitement in Cowes main street and was promptly arrested outside the police station. *Aeshna cyanea* seems to take the place of *A. imperator* in the late summer here. *Libellula depressa* has been fairly common and in late April I saw two companies of eight, and six, at rest. I suspect they were immigrants; they were in fair numbers throughout the summer, but not in abundance as in 1934. I had a close view of *Cordulia aenea*, the first I had seen for twenty years or more. Morey has no record of this species in his *Guide*, but thought it a probable resident. Another stranger was *Sympetrum sanguinea*, one example; several *S. striolata* were also seen.

COLLECTING NOTES.

COLIAS HYALE AND C. CROCEUS.—Since my previous notes were sent you, the weather has been very broken and sunny days few and far between. I have occasionally seen one or two *C. hyale*, and have taken three males, but have not noticed any more females.

On 2nd September I visited another field of lucerne, quite near home, and found *C. croceus* in considerable numbers, and in the freshest condition; evidence of a new brood having emerged. The last time I went there, on 12th September, the crop was being cut, and I captured a very fresh and beautiful specimen of *Colias hyale* (a ♂) which could not have been long out of the chrysalis, from which it appears that an autumn brood of that species may be expected.

It was a revelation to see *croceus* in really new condition, the colouring being marvellous. When I first found them in early August a large proportion were worn.—CECIL M. GUMMER, 14 Manor Road, Deal.

VARIATION IN MIMAS TILIAE.—With reference to Mr Sperring's description of a specimen of *Mimas tiliae* bred from a pupa found in the Portsmouth area, it may be of interest to record my experience of this insect in the same area. In May 1943 I found a pair of *tiliae* on a pavement in Portsmouth. I picked them up and dropped them into an open leather bag I was carrying. In the dim light of the train, on my journey home, the male decided that it was time to fly, and after buzzing around all the occupants of the carriage, it finally dropped down between the door and the window. The female sat still, and the following night she laid about 60 eggs. From these I obtained about 50 pupae, of which some dozen hatched out in 1944. The last of these, a female, had only a single spot on the forewings. This year about two dozen have hatched, and of these one female has the lower spot missing, and in one male it is represented by a tiny wedge-shaped spot. I have still about a dozen pupae, which I hope may emerge next year. I have had no success in persuading the moths to pair.—E. MONICA GIBSON, Ashcroft, Station Road, Petersfield, Hants, 8th October 1945.

HONEY-DEW.—Years ago, when I had many hundreds of larvae sleeved on Birch at my old home in the Midlands, I observed that aphides present on the leaves flourished exceedingly inside the sleeves, but outside, the foliage as a rule gradually became relatively clear. The idea occurred to me to maintain a balance by putting larvae of the Ladybird beetle inside the sleeves, and I found it quite effective. I am sure too that larvae fared better on the cleaner foliage. I was very successful with *Enargia paleacea*, for instance, after losing a young brood in a sleeve not so treated. It would be foolish to "dogmatise" on the subject, and I do not say I was ever wholly convinced by my own experiences, but as a "rule o' thumb" precaution I should always like to have a "sanitary squad" at work in any sleeve of larvae I had on Birch or other aphid-affected foliage. Granted that honey-dew is similar in its main chemical constituents to that of the foliage itself, we may be pretty sure that minute amounts of more or less toxic substances derived from the aphides are also present after the manner of eliminated or exuded material from other living organisms from dung to honey from the hive, to which they tell me the bee adds "a preservative." Further, we may surely suppose that having derived their vital sustenance from it in transit, the aphides have also subtracted something from the original whole—possibly vitamins that the chemist's analysis ignored—and so depreciated the food value of the leaf plus honey-dew.

Such deficiency might make larvae eventually less resistant to disease, for I doubt if they could make it up by an increased bulk intake. On the other hand, although I can well believe that by the absorption of gradually increasing quantities of a toxic substance, chemical or bacterial, in the honey-dew, many larvae build up an immunity to it (and so appear to thrive normally on the honey-dewed food), I should not expect to find young larvae inheriting such immunity.—FRANK H. LEES, The Gables, Maidencombe, Newton Abbot, S. Devon.

LOCAL NAMES—THE KING GEORGE BUTTERFLIES.—I have been interested in the correspondence on the King George Butterflies in the last few issues of the *Ent. Record*. When a boy in Nottingham it was

the universal rule to refer to all coloured butterflies as "Frenchies," due, I suspect, to having a hazy knowledge of *Colias croceus* and *Vanessa cardui* coming over from France. A young man I knew from Gainsborough always referred to coloured butterflies as "Jaspars"; it was quite common for Birmingham residents to refer to moths as "Bob owlers"; in Coventry, whatever living creature brought to me was referred to as a "Rhinocerpig"; here in the Isle of Wight for some obscure reason caterpillars are known as "Mallyshags," and gypsies as "Diddycoys"; but I have still to learn why the Cormorant is known as the "Isle of Wight Parson."—J. W. SAUNT.

UNUSUAL OBSERVATIONS AND CAPTURES.—The following immigrant notes from the Portsmouth area may be of interest.

P. machaon.—On 14th September a larva of this species was found in a street in Portsmouth. It has pupated, and it seems a probability that it was the progeny of an immigrant, in view of the fact that others of this species have been taken.

P. daphidice.—One specimen taken on the southern slope of Portsdown Hill.

C. croceus.—Three taken in streets of Portsmouth.

V. cardui.—Very common in the district in May and June, but only one specimen seen since. I have heard of others, but cannot verify them.

V. atalanta.—Larvae in dozens in the Havant district—about 50% parasitized. I have 40 pupae, but they are emerging very slowly.

P. aegon.—Two taken to the north of Portsmouth. This can hardly be regarded as a migrant, but I have worked the district since a boy and it has certainly never been seen there before.

H. convolvuli.—I took one specimen from a lady's wrist after dark. It obligingly remained there while she sent a friend to my house for a cyanide bottle.

D. galii.—With reference to my previous note (*Ent. Rec.*, Vol. LVII, p. 101), as far as I can estimate, various collectors, mainly boys, have taken about 200 larvae. One has had 12 emergences, another 1, a third 6, and I have had 7. Two of mine hatched while I was away from home, and are useless. A number of pupae are lying over, and it is to be hoped they will survive the winter.

M. stellatarum.—Common everywhere, in my garden especially at flowers of pink and white phlox.—A. H. SPERRING, Slindon, Fifth Avenue, Warblington, Hants.

THE FOODPLANTS OF COENONYMPHA TULLIA, MÜLL.—The foodplant of this species of butterfly is almost always recorded in British textbooks as *Rhynchospora alba*, although Meyrick adds "*Carex*." On the Continent, in Spuler and Hofmann the list of plants chosen appears as "*Carex*, *Eriophorum*, also *Rhynchospora* and *Festuca* species." I have always doubted the usual British statement as I have captured the insect freely in areas in the Hebrides where *Rhynchospora* failed. In particular, I have put on record the view that, as I have observed the species flying freely in a *Molinia* slack on the Isle of Scalpay where the Blue Moor grass grew in almost pure culture, one of its foodplants was the grass, *Molinia caerulea*. This view is now confirmed by the

fact that I observed a female drying its wings on a patch of *Molinia* in Glen Shellesder, Isle of Rhum, where *Rhynchospora* and other reputed foodplants were absent.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne.

AMATHES CASTANEA, ESP., IN THE ISLE OF RHUM.—During one of my early morning searches in the verandah of Kinloch Castle, I captured two examples of what I supposed, from a very cursory inspection, to be the red form var. *rufa* of *Triphaena comes*. However, as I was caging them for eggs, I perceived that one of them was an example of the typical form of *Amathes castanea*, Esp. I may add that my *Triphaena comes* produced large numbers of eggs from which now (3rd October) I have fully-grown larvae.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne.

THE GALL-GNAT PERRISIA GALII, H. LÖW., ON CORALAG.—Coralag is a tiny islet lying to the north of the Isle of Muck. For its size it carries a fairly heavy flora, of which *Galium verum* (Ladies' Bedstraw) is a member. That plant supports a strong colony of *Perrisia galii*.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne.

LEPIDOPTERA IN SPIDERS' WEBS.—On the Isle of Rhum, one can usually help to pass a wet day by examining spiders' webs for Lepidoptera. This season, although very dry, the examinations were continued, with the result that specimens of *Thyatira batis*, *Plusia interrogationis*, *Aleis repandata*, *Lyncometra ocellata*, and *Leucania impura* were obtained.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne.

LARVAE OF THE CURRANT MOTH (ABRAXAS GROSSULARIATA) ON HAZEL. Whilst I was beating hazels along the north shores of Loch Eynort, Isle of South Uist, I noted that in every case the stool shoots at the bases of the trees were finely fretted. This I assumed to be the work of weevils which were producing similar damage on *Salix aurita*. However, as I had to crawl under some of the trees, I turned over some of the affected leaves. To my surprise, I found that they were covered with swarms of tiny larvae of *Abraxas grossulariata*. This observation is not unique, for I had seen hazels defoliated by adult larvae on a hill slope north of Lochboisdale on the same island. In the Hebrides, Inner and Outer, the usual foodplants are *Calluna vulgaris* (Common Heather) and, less frequently, various *Salix* species. In the latter case, if any species is preferred it is *S. atrocinerea*.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne.

THE RANGE OF THE SIX-SPOT BURNET IN THE ISLE OF SOUTH UIST.—We have always looked upon the area covered by this species on South Uist as very restricted. However, its detection north of Lochboisdale a few years ago gave an east coast station for it. Now, in August 1945, cocoons were discovered at the base of a little aspen thicket growing on a low cliff facing south on the south shore of Loch Eynort. Similarly, a colony was examined on a loch side on the transition zones between the moorland and machair between Bornish and Ormaclett on the same island.—PROF. J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne.

SPILOSOMA LUTEA, HUFN., AND *S. LUBRICIPEDA*, L., IN THE SCOTTISH WESTERN ISLES.—Last year I was able to add the Buff Ermine (*S. lutea*) to the Outer Hebridean list on the strength of larvae beaten from nettles at Arinambane, on Loch Eynort, Isle of South Uist. Imagines have now been bred, and it can be said that they are characterized by the almost complete lack of the usual black markings proper to the species. This season, larvae were taken once again at Arinambane from burdock. In addition, others were beaten from *Salix atrocinerea*, hazel and bramble along the Allt Volagir, a mountain burn flowing from Beinn Mhor into Loch Eynort. *S. lutea* was also procured from bracken on the north shore of Loch Scresort, Isle of Rhum, and later, in August, crowds of larvae were observed on the same plant. It occurred also on the Isle of Eigg. The White Ermine (*S. lubricipeda*) was noted much more rarely on the Isle of Rhum on the stream which links the Long Loch with the Kilmory Burn. The species has likewise been captured on the Isles of Eigg, Muck, and Coll.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne.

ACENTROPUS NIVEUS, OL., AT SOUTHAMPTON.—This elusive species has been one of my special wants for many years, and I have given much time and trouble to the search in many spots that seemed likely to yield it. However, in the end it was quite by chance that I turned it up in numbers on a lake on Southampton Common, not ten minutes' walk from home.

Walking at dusk by the pondside, I saw a whitish insect buzzing along on the surface of the water. The resemblance to a caddisfly was remarkable, as was also the late date—15th September 1945. Further search yielded many corpses floating about among the scattered sedges by the water's edge. The next day in the afternoon I took numbers of ♂♂ in perfect condition, sitting close to the surface on the stems of sedge. They were difficult to box without wetting the pillbox. Three specimens were seen being carried about by Gerrids, and one predator was caught still firmly grasping its prey. This Gerrid was immature, the other two being full grown and too nimble to catch. Patient search gave me no ♀♀ and I went next day towards dusk to make a special search for them. Only one ♀ was found, wriggling along on the surface of a small patch of open water among the sedge. It was quite wingless and had to be scooped up, water and all. Bad weather prevented any further search, and no more specimens, ♂ or ♀, were seen.

A look through the literature is interesting. The usual dates of appearance are given as May, June, and August, September, in two generations. The ♀♀ are normally semi-apterous, rarely with wings completely developed (form *hansoni*, Steph.), and there seem to be fewer records of ♀♀ completely apterous. The ♂♂ are recorded as sitting on pieces of floating wood, especially on the underside; but though the lake is half covered with all kinds of floating debris from a nearby American camp, not a specimen was found on this debris, while plenty were at rest on the sedges. I find few records of ♀♀ swimming along on the surface of the water; they are said to crawl about on stems well submerged and to come to the surface only to pair up, after which the pair "in cop" crawl deep down into the water.

So far as I am aware, this is the first Hampshire record.—
WM. FASSNIDGE.

DOES WEATHER INFLUENCE OVIPOSITION?—In his article on "Honeydew" An Old Moth-Hunter suggests that a female *A. leporina* "flew under a bush because it was a stormy night, and finding it a convenient sheltered spot . . . laid her eggs there." If this were so, it would follow that oviposition is conditioned by the weather. It is a plausible theory and has been put forward before now (see, for example, *Ent. Rec.*, vi, 212, where it is remarked "in wet years, the eggs of Lepidoptera are laid in more sheltered places, instead of in the open, and thus the young larvae gain protection"). So far as one species, *Polyplocia ridens*, Fab., and one locality are concerned, however, this theory does not seem to be borne out by facts. In 1944 the moths of this species began to emerge, in a cage which had been in an outhouse all winter, on 12th April. Except for 13th and 16th April there were rain and strong winds in that locality on each succeeding day until 3rd May, when the wind veered to the East. In the following June every larva of *P. ridens*, from 2nd to 4th instar, which was found in that locality was on the outermost boughs of the oaks, usually on branches immediately over one's head.

In 1945 *P. ridens* began to emerge in my cage on 29th March, and, except for the period 1st to 4th, April was a remarkably fine month, my diary recording the weather from the 12th to the 27th as "fine and warm." Yet every larva of this species that was found at the beginning of June was either on the short trunk-shoots of young oaks or on branches within a yard of the trunk, and thus well underneath the outer branches. Some hours on several afternoons were spent by my wife and myself in searching outermost boughs whereon we had found *ridens* larvae in 1944, and not one did we find in these situations. But on the trunk-shoots, often within two feet of the ground, we found a fair number, all in the third stadium. In that locality the weather during May and June in 1944 and 1945 was much the same.—P. B. M. ALLAN, 4 Windhill, Bishop's Stortford.

LATE ABUNDANCE OF *P. BRASSICAE*.—An abundant brood of *P. brassicae* appeared here in the last week of September, and continued flying in numbers till 7th October, and in fewer numbers for five days later, occasional specimens being on the wing till the 17th. Some of those that I caught had underside hindwings of the pale greenish shade I described and exhibited some years ago, and all had the black dusting of the spring brood though less of it than the spring specimens show. Here, at any rate, the spring brood was scanty, and, no doubt in consequence, the species was distinctly rare in the summer; this suggests that their autumn abundance mainly at any rate consisted of immigrants. While the underside was far more like the spring than the summer brood, the upperside was quite that of the latter, with deep black tips and spots.—(REV.) GEORGE WHEELER, M.A., F.R.E.S., Worthing.

HERSE CONVULVULI IN SCOTLAND.—A damaged specimen of *Herse convulvuli* was handed to me a few days ago, having been taken in a house at Kairnhill near Paisley, Renfrewshire, Scotland; presumably it had been attracted by light. I understand the date of capture would be about the middle of August. Trusting this record may be of interest.—ALAN M. MACLAURIN, Suilvenbeg, Kilmacolm.

prominently in the middle of the dark ground. The hindwing white-grey, dark grey before the margin. The fringes without reddish suffusion." Hamp., *Cat. Lep. Ph.*, V, 136 (1905); remarks: "Dark purplish-grey-brown instead of rufous."—Finland, Lapland, E. Siberia.

ab. *aestiva*, Rothke, *Ins. Börse.*, XIX, 164 (1902).

ORIG. DESCRIP.—"In general colour is darker than the usual form of *pisi*, the strong red-brown of the forewings is almost wholly obsolescent and makes the ground of a dull brown, as also the rest of the tones of colour are duller and darker, and this tone is maintained by the hairing of the thorax and abdomen. Further characteristics are the obsolescence more or less complete of the hind marginal line except the anal angle blotch which is smaller but more sharply impressed. The W in most of the examples before me only recognizable by a paler space in the ground colour, the darkest examples have lost it. The orbicular is smaller than usual. As are the forewings so are the hindwings duller and darker. Nor is the violet shimmer to be observed in these dark examples." Crefeld, August.

ab. *saltalensis*, Strand., *Arch. Math. og Nat.*, V, 25, p. 11 (1903).

ORIG. DESCRIP.—"It is especially noticeable by a more uniform marking, as well as by its larger size. The ground colour dark brown with reddish flush without grey suffusion and only on the inner half of the central area slightly yellowish. No darker scale-streak through the central area; red-coloured between the two stigmata, "diese von der Grundfarbe ausgefüllt und deshalb undeutlich. Die Querlinien kaum wahrnehmbar," the waved line indistinct, the spot on the inner angle very small. The waved line outside not black lined. The fringes of the forewings more unicolorous." Kristiana Museum.

subsp. *nyiwonis*, Mats., *Jn. Coll. Agri. Sapporo.*, XV, III, 133 (1924-5).

FIG.—*l.c.*, plt. 10, f. 21 (very poor).

ORIG. DESCRIP.—"♂ primaries with a broad dark brown band in the middle between orbicular and reniform; submarginal line conspicuous, being nearly of the same breadth throughout, except somewhat narrower at the costa; in a certain light with a purplish shade as that of subsp. *scotica*, Tutt." N. Saghalien.

ab. *striata*, Ckyne., *Ent. Record*, LI, 8 (1939).

ORIG. DESCRIP.—"Forewings light red-brown with the dark markings nearly obsolete; interneural spaces ochreous almost to the termen contrasting with the dark nervures; ochreous subterminal line and mark at anal angle distinct; hindwings much paler than usual with dark nervures, outer part of the interneural spaces pale ochreous forming a border 2 mm. wide. Type, female, from the Howard Vaughan and Hanbury collections.

Tutt (*Brit. Noct.*, p. 90) said he has occasionally noticed a tendency for longitudinal ochreous streaks to be developed between the nervures, in the red forms of *pisi* between the subterminal and elbowed lines, and compared it with *Agrotis (Euxoa) nigricans*, ab. *striata*. Of this form, which is transitional and may be the heterozygote of that described above, I have a male bred from about 150 wild larvae collected on Barnes Common."

Hadena, Ochs. & Treit. (1816-25), Haw., Steph., Tutt, Barr. [*Polia*, Ochs. & Tr. (1816-25), Hamp.; Warr.-Stz.: *Melanchra*, Hb. (1820), Meyr., Meyr.: *Mamestra*, Hb. (1821), Stdgr., Splr., South, Culot:] *thalassina*, Rott. (1776) [Hufn. (1766)].

Tutt, *Brit. Noct.*, III, 92 (1892): Meyr., *Handb.*, 84 (1895): Barr., *Lep. Br. Is.*, IV, 173, plt. 156, 2 (1897): Stdgr., *Cat.*, IIIed., 157 (1901): Splr., *Schmet. Eur.*, I, 171, plt. 36, 16 (1905): Hamp., *Cat. Phal.*, V, 96 (1905): South, *M.B.I.*, I, 243, plt. 121, 7 (1907): Warr.-Stz., *Pal. Noct.*, III, 71, plt. 16c (1909): Culot, *N. et G.*, I (1), 103, plt. 17, 9 (1911): Meyr., *Rev. Handb.*, 155 (1928).

Hufn., *Berlin Mag.*, III, 298, called *thalassina* the "glossy red" (1766) and briefly described it.

Rott., *Naturf.*, IX, 119, described it more fully (1776).

Esper, *Noct.*, IV, 426, plt. 136, 1-2 (1789+?), gave under the name *v-latinum* a figure which Wernebg. ascribed to *thalassina*; Treit. and H.-S. to *genistae* (but no coppery colour).

Ernst & Engr., *Pap. d'Eur.*, VII, 94, f. 474b, c, d (1790), gave three excellent figures under the title the "Double W."

Bork., *Naturg. Noct.*, IV, 386, suggested that Schrank, *Naturf.*, XXIII, 147, was right in his recognition of Schiff. in the *Verz. Wien*, as the same species, but that Hufn. did not have an actual specimen before him.

Hb., *Samml. Noct.*, 483 (1809-13), labelled *gemina*, is an excellent figure of a very variegated, brightly marked form of *thalassina*; *i.e.*, 610, is a well marked but much duller reddish form (typical?) of this species under the name *achates*; *i.e.*, 498, was also an excellent figure of a well marked form of *achates*.

Haw., *Lep. Brit.*, 190 (1809), described the British form under the name *humeralis*.

Dup., *Hist. Nat. Noct.*, VI, 292, plt. 91, 3 (1826), gave an excellent figure of a somewhat rich brown form.

Treit., *Schm. Eur.*, V (1), 342 (1825), said it was somewhat like *adusta*, and that it is often that errors arise because an author does not check his work: That Hübner had made errors from this cause in his more recent work and that Ochsenheimer himself was not wholly blameless for this failure to check his work. That Hübner's named figure, the *Noct.* 482 was *gemina* ♂ and gave the figure 483 on the same plate as the female of *gemina* whereas the figure was that of *thalassina*. That Hüb. had made another error probably from the same oversight in naming figures 498 and 610 as ♂ and ♀ *achates*, whereas both these figures were *thalassina*.

Frr., *New. Beitr.*, I, plt. 11 (1835), said that his *achates* was not *thalassina*, Hufn., either in facies or life-history.

Steph., *Ill.*, II, 184 (1829), said "in some examples the anterior wings are adorned with a brilliant purplish tint, and in others the paler marks are elegantly shaded with yellowish."

Gn., *Hist. Nat.*, VI, 103 (1852), cited the *achates*, Hb., and the *humeralis*, Haw.

Barrett, *i.e.*, plt. 156, gave four figures: 2, a ♂; 2a, a dark ♀; 2b, a ♂ with obsolescence of numerous lighter markings and thus more uniform; 2b, a ♂ with absence of the purple shade leaving the dark brown.

Stdgr., *Cat.*, IIIed., 157 (1901), gave *achates* as the only ab.

Hamp., *Lep. Ph.*, V, 96 (1905), cited *humeralis*, Haw., *gemina*, Hb., and *achates*, Hb.

Splr., *Schm. Eur.*, I, 171, plt. 36, 16 (1905), gave a good figure of a typical form. He recorded ab. *achates*, Hb.

South, *M.B.I.*, I, 243, plt. 121, f. 7 (1907), gave a very good figure.

Culot, *N. et G.*, I (1), 103, plt. 17, 9 (1911), gave a very good well-marked figure of this species.

Warr.-Stz., *Pal. Noct.*, III, 71, plt. 16c (1909), gave five figures, ♂ and ♀ typical, ab. *achates*, uniform red-brown, ab. *humeralis*, fuscous grey with no red tints, and ab. *nigrifusa*, wholly suffused with black. The *gemina*, Hb., they considered a Syn.

On the Variation Barrett said:—

As a rule only a little variable in the depth of colour of the central portion of the forewings, and still less so in the marbling of the remainder, but occasional specimens occur of a smoother, paler purple-brown with but little marbling, while others are darker, altogether more dull in colouring, with the pale shades and markings more or less suppressed, the subterminal line alone remaining distinct. A specimen reared by Mr A. W. Mera, and exhibited to the S. London Society in November 1896, is wholly of a dull dark dusky brown, with hardly any trace of markings except the yellowish basal patch.

The Forms and Names to be considered:—

Hufn. (1766), *Berl. Mag.*, III, 298.

thalassina, Rott. (1776), *Naturf.*, IX, 119.

ab. *humeralis*, Haw. (1809), *Lep. Br.*, 190.

ab. *achates*, Hb. (1808-18), *Saml.*, 498, 610.

gemina, Hb., *l.c.*, 483. Syn.

ab. *nigrifusa*, Warr.-Stz. (1909), *Pal. N.*, III, 71.

ssp. *contrastata*, Bryk. (1943), *Iris*, LVI, 41, descrip. not available.

Tutt dealt with: (1) The greyish-brown *humeralis*, Haw. (2) The reddish marked, mottled form (typical). (3) The more unicolorous form, reddish tinged *achates*, Hb.

ab. *nigrifusa*, Warr.-Stz., *Pal. Noct.*, III, 71 (1909) “ = *Exarnis gemina*.”

ORIG. DESCRIP.—“ Is wholly suffused with black; the orbicular stigma and traces of outer and submarginal lines remaining pale grey.” No locality given. I have one from Capri.?

Hadena, Ochs. & Tr. (1816-25), Haw., Dup., Steph., Barr., Tutt [*Polia*, Ochs. & Tr. (1816-25), Hamps., Warr.-Stz., Drdt.-Stz.: *Mamestra*, Hb. (1822), Stdgr., Splr., South, Culot: *Melanchra*, Hb. (1822), Meyr., Meyr.] *contigua*, Vill. (1789).

Tutt, *Brit. Noct.*, III, 93 (1892): Meyr., *Handb.*, 83 (1895): Barr., *Lep. Br. Is.*, IV, 147, plt. 156 (1897): Stdgr., *Cat.*, III ed., 157 (1901): Splr., *Schm. Eur.*, I, 172, plt. 36, 14 (1905): Hamp., *Lep. Phal.*, V, 93 (1905): South, *M.B.I.*, I, 243, plt. 121, 6 (1907): Warr.-Stz., *Pal. Noct.*, III, 71, plt. 16d (1909): Culot, *N. et G.*, I (1), 103, plt. 17, 10 (1911): Drdt.-Stz., *Pal. Noct. Supp.*, III, 99 (1931).

Esper, *Noct.*, IV, 547, plt. 160, 8 (1789+?), gave a figure, with chaotic marking, under the name *ariae*, of *contigua* (teste Wernbg.).

Ernst & Engr., *Pap. d'Eur.*, VII, 91, f. 472 a, b, d, f (1791), gave four very well-marked variegated light figures, which Werneburg identifies as *contigua*, *l.c.*, II, 118.

Hb., *Samml Noct.*, 85 (1800-3), gave a very good figure but rather dull, 609 (1808-18) is a brighter figure.

Haw., *Lep. Brit.*, 189 (1809), described this species under the name *dives* with a form *pulchellum*: "Thorace cinereo striga transversa nigra, alis diversicoloribus, fascia antrorsum obliqua alba interrupta, margine postica subfusco striga alba." He said that "this beautiful insect was perhaps a sexual variation only of *dives*." He said that *dives* was the *contigua*, Hb., but not *contigua*, Fb.

Dup., *Hist. Nat. Noct.*, VI, 289, plt. 91, 2, gave an excellent figure of a well-marked typical form.

Treit., *Schmet. Eur.*, V (1), 352 (1825), said the *spartii* of Bork., p. 352, the *ariae*, Esp., plt. 160, 8, were synonyms. He also pointed out that there was a printer's error in citing *antiqua*, Schiff., as a Syn.

Gn., *Hist. Nat.*, VI, 103 (1852), cited *spartii*, Brahm, the *rufimacula*, Bork., *ariae*, Esp., and *dives*, Haw., but he questioned the *contigua*, Schiff., being this species.

Barrett, *l.c.*, plt. 156, gave three quite good figures, 1b is a Scottish form with white orbicular, a white anal angle blotch, the transverse line outside the reniform indicated by small white spots, and generally lighter appearance.

Stdgr., *Cat.*, IIIed., 157 (1901), gave only ab. *subcontigua*.

Splr., *Schm. Eur.*, I, 172, plt. 36, 14 (1905), gave a figure of a typical form and recorded the darker ab. *subcontigua*, Ev., and described a new form, ssp. *amurensis*, of a reddish-grey.

Hamp., *Lep. Ph.*, V, 93 (1905), cited *ariae*, Esp., *spartii*, Brahm, and *subcontigua*, Ev.

South, *M.B.I.*, I, 243, plt. 121, 6 (1907), gave a very good figure of a well variegated form.

Warr.-Stz., *Pal. Noct.*, III, 71, plt. 16d (1909), gave three figures, ♂ and ♀ typical and ab. *subcontigua*, a dark suffused form without the pale patches, from the Ural Mts. They also give the ssp. *amurensis*, Splr. They considered *ariae*, Esp., *spartii*, Brahm, and *dives*, Haw., as *Syns*.

Culot, *N. et. G.*, I (1), 103, plt. 17, 10 (1911), gave an excellent figure of a typical form.

Drdt.-Stz., *Pal. Noct. Supp.*, III, 99 (1931), recorded ab. *contiguella*, Krul., ab. *decolor.*, Bng.-H., ab. *spuleri*, Wruk., and considered that *dives*, Haw., is not synonymous.

Of the Variation C. G. Barrett said:—

Not very variable, but having fixed climatal races; specimens from the southern districts being of full size, with the clouding dark purple-brown, and rather extended; those from northern hill districts, and especially from Scotland, of rather smaller size, with the costa of the forewings straighter, and the clouding somewhat lighter and more tinged with red. In Ireland, very rich, but evanescent, colouring seems to be assumed. Mr W. F. de V. Kane records an example taken at

Sligo which was wholly suffused with rose-colour; and Mr C. A. Watts found one, freshly emerged, in the Mourne Mountain district, Down, which showed a strong suffusion of pink over the darker area, and of green over the basal area, anal angle and reniform stigma. After death these colours gradually faded, and when it was forwarded to me they were only just traceable. In both northern and southern specimens the oblique pale stripe is occasionally interrupted in the middle by a dark cloud.

The Names and Forms to be considered:—

contigua, Vill., *Linn. Ent.*, IV, 468 (1789).

ariae, Esp., *Abbild.*, IV, 160, 8 (1789+?). Syn.

spartii, Brahm, *Kalend.*, II, 323 (1791). Syn.

ssp. ? *dives*, Haw., *Lep. Brit.*, 89-90 (1809).

ssp. *subcontigua*, Ev., *Bull. Mosc. Noct.*, I, 155 (1852), II, plt. 2, 1, III, 19.

ab. *contiguella*, Krul., *Rev. Russ.*, IX, 305 (1905).

ssp. *amurensis*, Splr., *Schmet. Eur.*, I, 172 (1907).

ab. *decolor*, Bang.-Hs., *Iris*, XXVI, 145 (1912).

ab. *spuleri*, Wrnke., *Zool. Anzeig.*, LXXXIII, 224 (1929).

ab. *albomaculata*, Lempke, *Cat. Ned. Mac.-Lep.*, V, p. 237 (*Tijd. v. Ent.*, Vol. 83 (1940)).

ab. *tangens*, Lempke, *l.c.*

Tutt gave descriptions of (1) the type *contigua*, Vill.; (2) the *dives*, Haw., and British form of *contigua*.

Haworth, *Lep. Brit.*, 1809-90, described the British form under the name *dives* = the *contigua*, Hb. (nec Fab.). He also described the *contigua*, Fb., on p. 192 = *aliena*, Hb.; but did not discuss any locality.

ab. *amurensis*, Splr., *Schm. Eur.*, I, 172 (1907).

ORIG. DESCRIP.—“In Amur in the collection of M. Daub are somewhat more elegant in wing shape, reddish-grey very suffused and mixed in marking.”

race *subcontigua*, Ev., *Bull. Mosc.*, I, 155 (1852).

FIG.—*Bull. Mosc. Noct.* (1855), plt. II, fig. 1.

ORIGINAL DESCRIP.—“*Alis anticis nigricanti-cinereis, umbrosis: maculis ordinariis pallidioribus; striga submarginali alba, in medio dentibus duobus obtusis instructa; posticis griseis, externe nigricantibus.*”

“Somewhat smaller than *glauca* or *contigua*; with both of which it has a similarity, but distinguished from both by the submarginal line which is white and has in the middle two distinct teeth, which do not reach to the outer margin and the points of which form somewhat less than a right angle. Head, thorax and forewings are of somewhat of the same colour as in *proxima*; they are black-grey, the last paler, grey sprinkled. The orbicular and reniform are paler than the ground, but distinct; the inner and outer transverse lines are slightly emphasised by black lines; the wedge stigma is not to be seen; the black-grey fringes are interrupted by narrow white streaks.”

“The underside of the forewing is blackish-blue, with paler marginal veins and paler outer margin. The hindwings are grey, with blackish

outer line and blackish shaded streaks before the outer margin." S.-West foothills of the Urals.

Hamp., *Cat. Lep. Ph.*, V, 93 (1905). Darker.—Urals, Spask.

ab. *contiguella*, Krul., *Rev. Russ.*, IX, 305 (1909).

DESCRIP.—[Drdt.-Stz., *Pal. Noct. Supp.*, III, 99] "From Wiatka is a darker greyer form resembling *Polia altaica*."

ab. *decolor*, Bng.-H., *Iris*, XXVI, 145 (1912).

ORIG. DESCRIP.—"From the Juldus area, we have received a number of more striking specimens, which are of essentially paler colour, and with far more grey powdering than in the usual European examples, the hindwings are also far paler."

ab. *spuleri*, Wnuskow., *Zoo. Anzeig.*, LXXXIII, 224 (1929).

DESCRIP.—[Drdt.-Stz., *Pal. Noct. Supp.*, III, 99] "is unnecessary."

ab. *albomaculata*, Lempke, *Cat. Nederl. Macrolep.*, pt. V, p. 237 (*Tijd. v. Ent.*, 1940).

ORIG. DESCRIP.—"With large snow-white orbicular stigma."

ab. *tangens*, Lempke, *Cat. Ned. Mac.-Lep.*, pt. V, p. 237 (*Tijd. v. Ent.*, 1940).

ORIG. DESCRIP.—"The inner line and the outer line touch each other in the place of the claviform stigma, which has completely disappeared. (R. Boldt)."

Hadena Ochs. & Tr. (1816-25), Gn., Tutt, Barr. [*Polia*, Ochs. & Tr. (1816-25), H.-S., Hamp., Warr.-Stz.: *Melanchra*, Hb. (1820), Meyr., Meyr.: *Mamestra*, Hb. (1821), Stdgr., Splr., Sth., Culot] *genistae*, Bork. (1792) = [*w-latinum*, Bork.]??

Tutt, *Brit. Noct.*, 94 (1892): Meyr., *Handb.*, 88 (1895): Barr., *Lep. Br. I.*, IV, 190, plt. 158, 2 (1897): Stdgr., *Cat. IIIed.*, 157 (1901): Hamp., *Lep. Phal.*, V, 95 (1905): Splr., *Schm. Eur.*, I, 171, plt. 36, 25 (1905): South, *M.B.I.*, I, 241, plt. 121, 1 (1907): Warr.-Stz., *Pal. Noct.*, III, 71, plt. 16d (1909): Culot, *N. et G.*, I (1), 162, plt. 30, f. 1-2 (1913): Meyr. *Rev. Hand.*, 154 (1928).

Ernst & Engr., *Pap. d'Eur.*, VII, 93, f. 473 a, b (1791), gave two figures, which Wernebg., *l.c.*, identified from the reddish marking as *genistae*.

Pezold in *Scriba's Beitr.*, III, 241, plt. XV, 13-14 (1793), spoke of the violet-grey and brown forewings with paler crenate strigae, and gave a very long detailed description of *genistae* as we know it. The figure has much deteriorated in my copy and is of little value.

Bork., *Naturg. Noct.*, IV, 357 (1792), cited the figure in *Scriba's Beitr.*, pt. III, *l.c.*

NOTE.—I am unable to explain the date. I have copies of both works. Werneburg agrees with both dates.—HY. J. T.

w-latinum, Bork., *Naturg.*, IV, 378 (1792), is described by Bork., with ground colour "pale brown" and "dark brown," does not mention

red, nor does he refer to violet "schimmer" as in *genistae* and the white or yellowish marking is very sparse. Wernebg. suggested that it was more like *oleracea* than *genistae*. There are very distinct differences in the W mark. In *genistae* it is elaborated, in *oleracea* simple.

dives, Don., *Nat. Hist.*, pt. X, p. 71, plt. 352 (1801), gave a figure, which Wernebg. said much resembled *remissa*, but that the strongly developed W in the marginal line must show it is *genistae*, Tr. (*w-latinum* v. Rott.). Syn.

Hb., *Samml. Noct.*, 611, 612 (1808-18), gave two excellent figures.

Haw., *Lep. Brit.*, 159 (1809), described a species under the name *rectilinea*. Most authors have cited it as *genistae*.

Dup., *Hist. Nat. Noct.*, VI, 285, plt. 91, 1 (1826), gave a rather plainly marked, but very good figure.

Treit., *Schmett.*, V (1), 349 (1825), cited *w-latinum*, Bork., IV, 578, Esper; plt. 136, 1-2, Hufn., III, 294, and *Naturf.*, IX, 114, as a Syn. He said that Ochs. (in a letter) did not place much reliance on the citation of Bork. of *w-latinum*, Bork., and Esp. to *genistae*, and that he himself thought that fig. 3 of Esp. was *suasa* and that 1 and 2 were *thalassina*; *w-latinum* might even be a species.

Frr., *N. Beitr.*, I, 40, plt. 22 (1833), gave a good figure of a light grey form. He said the ground colour was yellowish-white contrasted with *contigua*, which had greyish-white ground colour.

H.-S., *Bearb. Noct.*, II, 280 (1847), said that Hb.'s figs. 611-12, were very good, but as a rule the insect is greyer. He said that Frr.'s fig. was a very grey example.

Gn., *Hist. Nat.*, VI, 104 (1852), used the name *w-latinum*. He cited *genistae*, Pezold in *Scriba*, p. 241, plt. 15, f. 13-14; *rectilinea*, Haw.; *rufimedia*, Engr.; and *dives*, Donovan. He also referred to this species as occurring in N. America. He said the name was incontestably prior, which he regretted as *genistae* had been in general use. He also referred to an aberrant form A, which is smaller and paler and intermediate with *contigua*.

Barrett, *l.c.*, plt. 158, has two figures of typical forms.

Meyrick, *Handb.*, 83 (1895), used the genus *Melanchra* in both editions.

Stdgr., *Cat.*, IIIed., 157 (1901), cited *w-latinum* and *subjuncta* as Syns.

Hamp., *Lep. Phal.*, V, 95 (1905), under the name *w-latinum*, Hufn., cited *genistae*, Bork., *dives*, Don., and *rectilinea*, Haw.

Splr., *Schm. Eur.*, I, 171, plt. 36, 25 (1905), gave a good figure of a typical form. He also referred to the more reddish form with its yellowish stigmata.

South, *M.B.I.*, I, 241, plt. 121, 1 (1907), gave a good figure.

Warr.-Stz., *Pal. Noct.*, III, 71, plt. 16d (1909), figured a typical form. They considered *dives*, Don., and *rectilinea*, Haw., as Syns.

[Differs from *contigua* in having no pale blotch at base of vein 2, or on inner margin beyond the middle.]

Culot, *N. et G.*, I (1), 162, plt. 30, f. 1-2 (1913), gave two excellent figures, the two extremes a dark typical form and the light very varied f. *remissa*. The former of a brownish-reddish-grey, the latter with a ground of light yellowish-brown.

Of the Variation Barrett said:—

Hardly variable except in the depth of colour of the central purple-brown band which also sometimes becomes complete by suffusion of the usual pale dorsal-stripe.

The Forms and Names to be considered:—

genistae, Bork., *Naturg. Noct.*, IV, 355 (1792).

w-latinum, Bork., *l.c.*, 378 (1792). Syn.

dives, Don., *Br. Ins.* X, 71, plt. 352 (1801). Syn.

rectilinea, Haw., *Lep. Br.*, 189 (1809). Syn.

[*subjuncta*, Grote, *Tr. Am. E.S.*, II, 198, plt. III, 71 (1868)]? Amer.

ssp. *diniensis*, Heinr., *Deut. e. Zt.*, I, Nacht. 20 (1938).

n.f. **obsolescens**, n.f.

Tutt dealt with (1) Borkhausen's type giving his description and adding the description which Newman made in his "British Moths."

ssp. *diniensis*, Heinrich, *Beitr. sur Macro-lep. Faun. Digne*, Nachtr. II, 20 (1908).

ORIG. DESCRIP.—"Since the Race of that place is generally paler than the typical form, it forms a constant Race, for which this name is proposed."

obsolescens, n.f.

ORIG. DESCRIP.—Practically the whole of the markings are obsolescent on a unicolorous dark ground, in one example dark brown-grey with a slight purplish-red tinge, in the other a blackish-grey. The hindwings follow the prevalent ground of the forewings, with a slight deepening of black in the darker example. All the usual markings can be traced with much difficulty and patience. Perhaps the stigmata are the most distinct with the dark (black) shade between them, and the black dots on the costa. The various black sagittate spots can be found in miniature, the W has the usual accompanying marks traceable with a lens. The transverse sectional white lines of the division of the wings are excessively fine, but are there. The usual black or deep rich brown compound dish-shaped blotch in the centre of the wing is there in obsolescent remnants. The usual wide light submarginal area is so effaced that one's mind does not suggest *genistae* and there is only the slightest suggestion of a basal-costal light area. The black basal line at the centre can be discovered by searching. I have given them the most suitable descriptive name, *obsolescens*. These two examples come from Oberweiden, near Vienna, sent to me by the late Karl Höfer, to whom I am indebted for a very large number of varied Noctuae from the Continent.

Scoliopteryx, Germ. (1811) most authors [*Gonoptera*, Latr. (1825) Dup. Gn.] *libatrix*, L. (1758).

Tutt, *Brit. Noct.*, III, 97 (1892): Meyr., *Handb.*, 154 (1895); Barr., *Lep. Br. Is.*, VI, 259, plt. 252 (1900): Stdgr., *Cat.*, IIIed., 234 (1901): Splr., *Schmett. Eur.*, I, 297, plt. 47, 4 (1907): Sth., *Moths Br. Is.*, II, 63, plt. 22, 1 (1907): Warr.-Stz., *Pal. Noct.*, III, 361, plt. 52m (1913): Culot., *N. et G.*, I (1), 163, plt. 70, 8 (1916): Meyr., *Rev. H.*, 169 (1928): Drdt.-Stz., *Pal. Noct. Supp.*, III, 223 (1936).

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MALCOLM BURR, D.Sc., F.R.E.S.

E. A. COCKAYNE, A.M., D.M., F.R.E.S.,
F.R.C.P.

J. E. COLLIN, J.P., F.R.E.S.

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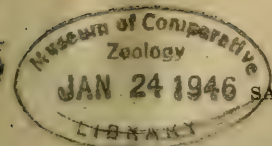
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SATURNIA PAVONIA, L., AB. MELANOMMATUS.

By E. A. COCKAYNE, D.M., F.R.C.P.

Saturnia pavonia, L., ab. **melanommatus**, ab. nov. On both surfaces of the fore and hindwings the yellow ring around the central part of the ocellus is replaced by black; the pale semilunar mark in the central part and the bluish crescent are present but indistinct, the scales of the carmine crescent are so mixed with black ones that it can only be seen with a lens. In other respects the markings and coloration are normal.

TYPE. ♀. Ashdown Forest, Sussex, iv.1944. Bred by J. Wright. Paratypes. 4 ♂♂, 4 ♀♀ in my collection and 1 ♂ and 1 ♀ in the collection of H. B. Williams, all with the same data. Aberrational specimens together with normal ones appeared in the same brood from inbred stock originating from Ashdown Forest, but no record of the numbers was kept.

There was also a gynandromorph with normal ocelli in the same brood, of which I give the following description. Right antenna male, except that there are no pectinations on the anterior surface of the distal half, left antenna female; both wings larger on the right side, the forewing especially being both longer and broader; on the upper surface the ocellus of the right forewing is larger and different in shape from that of the left; there is a white patch of female colour just external to the right ocellus between 4 and 5, and 5 and 6, a streak of grey female colour between 6 and 7, and a much longer streak running parallel with the costa; the apex is largely female; on the right hindwing the ocellus is broader than on the left. On the under surface most of the right forewing in front of nervure 5 is female, but there is a patch of orange, male coloration, just in front of nervure 5, and a longer one in front of 6, the rest of the wing is of male coloration; in the hindwing the anterior half of the ocellus and white patch just external to it are female, but the rest of the wing is male. The thorax and abdomen appear to be male.

The fact that several specimens of this aberration appeared in one brood obtained by mating a brother and sister suggests that it is recessive.

It differs from ab. *melanopsis*, Stättermayer, in which the carmine and pale bluish crescents are replaced by black, but the yellow ring remains, and from ab. *caeca*, Stättermayer, in which the central part of the ocellus is completely filled with black, but the yellow ring and the carmine and bluish crescents remain (*Z. Oest. Ent. Ver.*, 1920, 4, 60).

Although it is a minor aberration the blackness of the ocellus makes it conspicuous. The loss of the yellow ring, which is a very constant character in *pavonia*, and the fact that it has a genetic basis, entitle it to a name.

THE FOETID ARUM AND INSECTS.

By MALCOLM BURR, D.Sc., F.R.E.S.

Early in the summer a friend brought me a remarkable flower from the island of Buyukada or Prinkipo. It was a large *Arum*, twice the size of our "lords and ladies," of a deep purple colour, with a long, pointed spadix prominently protruding. The edges of the spathe are sinuate, and the green colour of the back is visible. It is a handsome, very striking plant. The lady told me she had seen it growing in her garden only once before, last year, and now a second one was appearing. The local folk look upon it with aversion, saying that it grows only near dead bodies. The reason is, of course, the cadaverous smell, which is notorious. For that reason, I kept the specimen in a back room, and so did not notice the smell. Perhaps it comes on only in the evening.

When I came to examine the plant, I found several beetles in it. As they seemed to be all one species, their presence was probably not accidental, so I sent them to Mr Arrow, who has given me the following very interesting report on them:

"The beetles you have sent me are *Saprinus nitidulus* (*Histeridae*.) This has a range from Britain to Japan. The larvae feed upon Dipterous larvae and the beetles were no doubt in search of carrion for oviposition. I believe the 'cadaverous' odour of Aroid flowers is a very general characteristic, but the native statement is probably an embellishment of the facts. In my volume on Indian Coprophagous beetles I quote a paper in *Journ. Asiat. Soc. Bengal*, X, 1914, p. 421, on the association between an Aroid and a beetle (*Onthophagus*): 'About sundown the freshly opened flowers emit a strong carrion-like odour, which has a marked attraction for the beetle; this is therefore presumably a carrion-feeder. A few hours later the lobes of the spathe begin to wrap around the spadix at the contracted part, the odour ceases, and the beetles are completely imprisoned until the next night . . . the strong carrion-like odour is given off from the pistillate flowers, but the staminate flowers will be found to be still immature . . . It is clear that the floral mechanism is of the nature of a trap and by this ingenious method the plant ensures cross-pollination.'

"As *Saprinus nitidulus* is so particularly smooth it would not be a good pollen-carrier and *Arum orientale* is probably trying to attract Diptera."

The flower was named for me by Dr Post, the authority on the flora of the Bosphorus, who tells me that it occurs sparingly on the Asiatic shore, but he has not seen it on the European side, and I have not either.

HERSE CONVULVULI AT MAIDENCOMBE, 1945.

By FRANK H. LEES.

At about 5 a.m. on the morning of 9th August I discovered a ♀ *H. convolvuli* resting just outside the entrance of my moth-trap and on the evening of the 10th I captured a fine ♂ over *Nicotiana affinis* in the garden. On 11th, 12th, and 13th August I made further captures (2 ♂♂ and 3 ♀♀). Then, after two blank evenings, I took a rather worn

♀ on the 16th, saw 2 or 3 on the 17th which I did not capture, and netted a ♂ in fair condition on the 18th. I did not visit my *Nicotiana* plants again till 21st, when I captured one out of at least three flying around. On the 22nd I took one out of two seen, and saw several on the 23rd, capturing one rather worn ♀. 24th August gave me another worn ♀, so that I inferred that no fresh emergences had taken place, which was confirmed by the worn condition of a ♂ netted on the 27th and released. I saw one ♂ on the 28th and then captured a nearly perfect ♀ on the 29th. Three blank nights followed chiefly on account of the weather. On 2nd September Mr G. P. Sutton took over my evening patrol of the *Nicotiana* bed and saw 5 *convolvuli* flying in spite of the rain. Three out of four he netted were ♀♀ in quite good condition. He saw several more on 3rd September, capturing 2 very nice ♂♂. The same evening a neighbour brought me a newly emerged ♂ taken at rest on the wall of his house—a very striking semi-banded insect. On 4th September Mr Sutton's bag was 3 ♂♂; he took 2 more on 5th September and another 2 on 6th September.

Left to carry on alone, I gave the *Nicotiana* a miss till the 8th, when I netted a very perfect ♂ out of 3 seen. A fairly good ♀ on 9th September, followed by 3 very perfect insects on 10th September out of at least 5 seen, made it evident that more than one brood had probably bred in our vicinity from unobserved May-June migrants. *Convolvuli* was over the *Nicotiana* again on 11th September and that was the night when my moth-trap once more took a hand in the business. Occupied with sitting in my room behind the trap at about 11 p.m., I heard a crashing noise that suggested that a bat was trying conclusions with the glass front. Investigating, I found resting outside the trap a ♂ *convolvuli* on one side and a ♀ on the other. In less than half an hour another crash brought me again to the scene—this time a ♂ *convolvuli* had gone right through the aperture (a bare $\frac{3}{8}$ in. wide). There were so many other insects inside with it (the trap took 218 "macros" that night, including 71 *Plusia gamma*!) that I thought it wiser to let *convolvuli* take its chance (it had already knocked the tip off one wing) and remain till morning. On the 13th I again had a look over the *Nicotiana* in passing and saw one *convolvuli*. From the 14th to 17th I saw 12 more. Of 4 captured I kept 1 good ♂, reserved 2 rather poor ♀♀ for ova and released an imperfect ♂. On 20th September I saw only one and again on the 21st. Netting the latter, it proved to be a fairly good ♀. 23rd September saw *convolvuli*'s final appearance for 1945—it was a very worn ♀, which I kept for ova. Altogether we captured 23 ♂♂ and 20 ♀♀ out of at least 73 observed. I've never taken more than three in a season before.

The disappointing way no fewer than nine ♀♀ kept for ova failed to produce more than 2 or 3 infertile eggs, I cannot understand. I tried every way to persuade them to lay. Five I dissected after they had died of old age contained apparently undeveloped ova, but surely all, both fresh and worn when captured, could not have been unpaired? Was it just bad luck, or do the May-June imagines arise from pupae that have passed the winter at that stage instead of emerging in the autumn? After all, any intermediate brood would have a perilous journey, as even continental winters provide rigours of a discouraging nature.

ANTS AND SPIDERS.

By MALCOLM BURR, D.Sc., F.R.E.S.

On the rolling moors on the European shores of the Bosphorus, on dry open ground, there are numerous nests of harvesting ants. Mr Donisthorpe informs me that the specimens I sent him were of *Messor dertzeni*, Forel, var. *amphigea*, Forel. Their middens are well marked by the pale green tender young blades of grass that shoot up out of them. Their well-beaten tracks can be traced for many yards into the scrub.

One evening, while I was watching them, I noticed that one looked ill. It was standing alone, quivering, and, as I watched, it collapsed. Then I noticed that a small spider was sucking it. The spider was light tawny in colour, with blackish abdomen.

I watched again and presently saw another of the little spiders make a lightning dash at an ant, and instantly withdraw. The ant at once stood still, quivered, and, in less than a minute, collapsed. Then the spider, which had been standing by, came and fastened on to it and dragged it away. There were several ants dead and dying on the midden. The spiders seemed very nervous and wary; they attacked only the biggest ants; they often failed to take advantage of many opportunities to attack, that to my human eyes seemed most desirable. Their movements are very rapid.

The ants seemed to pay no attention to the spiders, except once, when a big one made a savage assault at a spider, which at once bolted. It looked absurdly like a dog bluffing.

While watching the ants, I noticed that they were taking bits of dry grass, seeds, etc., down into their holes, but afterwards they were bringing them out again and rejecting them on to a heap of refuse, a regular kitchen midden. Is it possible that inexperienced ants were taking down useless stuff that had to be brought up again?

They closed up their holes at dusk, at which I gave them a helping hand. I noticed several sitting motionless on thistles, their heads buried in the down, while others were lazily chewing dry sheaths of succory and thistle, as though without any conviction.

Once I noticed one of the big ones dragging a *Chrysomelid* larva, three or four times as big as itself, but sluggish and unresisting; the ant had gripped it by the snout. Another time I found one dragging a nearly empty carcass of the little grasshopper *Pezotettix giornae*, Rossi.

On 12th October 1940 I found a big ant-midden a good metre across, with only one noticeable hole, about an inch in diameter, closed with a pellet of earth. Near it was sitting a rather large specimen of those ant-hunting spiders, moving restlessly, as though it could scent the ants. When I made a movement, it flashed away. There were several more of the spiders lurking nearby. On the same date this year I found the spider hunting round among them.

[The spider has been identified by Mr E. Browning, of the Natural History Museum, as *Zodarion simida*, Simon. Other species of the genus are also myrmecophagous, preying on *Messor* spp.—H. J. D.]

ENTOMOLOGY IN HOLLAND DURING THE WAR.

By B. J. LEMPKE.

It was of course inevitable that the war influenced the study of Entomology rather unfavourably. Working with light was out of the question. This was a great pity, as some of the war years must have been very particular. 1940 for instance presented us an early summer of such fine weather as I do not remember having ever witnessed. Treacling was continued by a few enthusiastic lepidopterists who were happy enough to possess the materials for this method of catching, but the great majority had to give up catching at night. The result was that those who had still enough energy, or were not obliged to hide themselves, had to content themselves with the *Rhopalocera*. It is, however, not an easy matter, to collect sufficient material of this group in Holland. Clouds of butterflies, as are reported from more favoured countries, are quite unknown with us. Yet we are not discontented about the results obtained.

The damage directly caused to collections, etc., by the war, is happily rather limited. Most collectors lived outside the actual grounds of action, but even the few collections which happened to be there, almost all wonderfully escaped destruction. For instance, the library and collections of the University for Agriculture at Wageningen, a small town on the Rhine west of Arnhem, which was evacuated for months, have hardly any damage. The severest case I know of is the pretty little museum at Velp, a beautiful village on the Ysel, north-east of Arnhem. This is completely destroyed, and with it the collection of De Roo van Westmaas, whose name is often to be met with in the older volumes of the second series of Sepp. It was a fine old collection which I examined some years ago. The data of it are not lost, however, as I made extensive notes. The famous collections of the Amsterdam and Leiden Museums are in excellent condition and so is the Library of the Netherl. Entom. Soc., which is, after Paris, Vienna, and Berlin, doubtless the best on the Continent.

Cases of robbery by the Germans are very few, a rather surprising fact, if one considers the enormous quantities of all kinds of goods which disappeared from our country, especially after September 1944. The explanation lies, perhaps, in the fact, that none of the higher occupants of Holland had any interest for Entomology. The only severe case happened at Maastricht, where the world-famed ant collection of Father Wasmann was "summoned" by the Berlin Prof. Bischoff, together with the very important standard collection of Phorides of Father Schmitz. They disappeared from the Maastricht Museum of Natural History and went to the German capital. One can only hope that they have survived the severe allied bombardments and that they return to Holland one day. But things are more quickly stolen than brought back in our experience. It is, however, simply incredible that an authority like Bischoff, who has a name to lose in the scientific world, degrades himself to such things.

The other losses are restricted to a moderate collection of Dutch and tropical Lepidoptera at Arnhem, and to a few microscopes of those who had to leave their home. Numbers are, however, not known, so that the owners have to reckon on a definite loss of their instruments.

We intend, of course, to continue our entomological work with new energy. Our Entomological Society celebrated its centenary at Amsterdam on 12th October 1945, and, though the ceremony was not as we had imagined through the inevitable complete absence of foreign guests, a very successful meeting was held to commemorate the enjoyable event. Even from the eastern and northern parts of our country members were present, who were not intimidated by travelling for hours in goods vans or in mail vans like herrings in a barrel.

One severe difficulty, however, arises: our pins are almost exhausted, and ether is not to be had. And as permits for paying in foreign coin are not obtainable for us, collecting becomes for many entomologists in the long run impossible. I therefore venture to ask: Would it not be possible to find a means to help us? I think, for instance, of the possibility of exchanging Dutch insects, which are hardly present in any foreign museum or collection, against the desiderata mentioned.

Amsterdam—Z., Oude Yselstraat 12³.

POSTSCRIPT.—The day after I had sent in the above article, I received the new no. of the *Natuurhist. Maandblad of Maastricht* (by the way, this magazine contains many articles of Schmitz on *Phoridae* and of Roepke on new *Heterocera* from Java) in which is stated what nobody had dared to expect: the two collections are back in the capital of Dutch Limburg. They were found by an American officer, Prof. Dr J. W. Bailey, in a Berlin "bunker," and the German Professor, Bischoff himself, was obliged to give them back. The allied officer, a man with a keen interest for Entomology, brought them back to the Museum of Maastricht. They were, of course, received with great enthusiasm.

COLLECTING NOTES.

LOCAL PTEROPHORIDAE IN EAST TYRONE, 1945.—*Platyptilia acanthodactyla* was first observed on 14th May in fresh condition among mixed herbage, a very early date for this species, as Barrett gives June and Meyrick states that it appears in July

P. isodactyla was abundant flying in the late afternoon in a marshy meadow over *Senecio aquaticus*, on 4th June. There was no appearance of an autumn emergence in this locality.

P. tesseradactyla was out in small numbers on 14th June, as the heather had been burnt off the previous autumn in its special locality N.W. of Cookstown, the moth at rest or feeding on the flowers of *Antennaria*.

P. punctidactyla (not previously recorded from Tyrone) was sitting at rest on ragweed blossom in the sunshine on 29th September, and was observed in some numbers almost every day when the sun was out, on ragweed or Hawk-bit, *Leontodon autumnale*. The imago is still about, 17th October, and in the year 1943 it was observed in very good condition on 12th November.

Its mode of life in this locality is very different to that quoted by Barrett, who states "that the moth is rather *secret* in its habits, hiding in dense hedges or among thick herbage in the *day time* but not easily disturbed and not often seen. It flies *at night* and will come to flowers of ragweed."

Perhaps some other observers will give some account of the habits of this species in their locality. (The italics in the last paragraph are mine.)
—THOMAS GREER, The Bungalow, Cookstown, Co. Tyrone.

HERSE CONVOLVULI IN SWANAGE DISTRICT.—From early September to mid October *H. convolvuli* has turned up in considerable numbers, mostly in fine condition. Also *M. stellatarum* was very common and *P. gamma* a real pest, both by day and night.—LEONARD TATCHELL.

P. ATALANTA AT SWANAGE.—For the past three weeks this species has come over in scores, all flying in from the S.E., settling on the Ivy blossom and Veronica and then moving off inland.—LEONARD TATCHELL, 19.x.45.

RHODOMETRA SACRARIA RECORDED IN S. DEVON.—I have one more unexpected capture to announce. Almost the first thing I saw in my moth-trap when I looked in on the morning of 10th October was *Rhodometra sacraria*, an absolutely perfect ♂. The crimson stripe is wider and much less tapered than in the fig. of *sacraria* in South or in Culot's *Géomètres*, though not quite so extreme as the latter's fig. of *sanguinaria*. The red costal streak is strongly marked but extends for only about a third of the distance from thorax to tip. One can just detect shadowy pink tinted areas between the nervures at the base and between the band and the outer margin, but they are not noticeable at first glance. There is, however, a very distinct pinkish spot about midway between the upper central portion of the stripe and the terminating point of the costal streak. None of the figs. referred to show this spot. I have not yet had time to go to Torquay Museum to consult Barrett and Seitz on this matter; we can look into that later on, but if you have the books at hand perhaps you wouldn't mind seeing if either authority refers to "the spot" I've described.

Since I sent in my last communication in which I said I had seen no late *L. exigua*, one specimen has turned up. It came into the moth-trap on the night of 10th October.—FRANK H. LEES, The Gables, Maidencombe, Newton Abbot, S. Devon.

CURRENT NOTES.

THE Annual Exhibition of the South London Entomological and N.H. Society on the afternoon of 27th October, added one more most successful gathering to a long long list of successful events. The attendance was quite good and the exhibits were illustrative of the curious and unusual season, productive of so many wanderers from other countries.

AMONG the personal reprints we have received are:—Mr T. Bainbridge Fletcher, the concluding pages of his "Micro-Lepidoptera of Gloucestershire"; a most useful local, up-to-date List with correct nomenclature. Also by the same author, "A Rough List of the Aculeate Hymenoptera of Gloucestershire." Both these Lists were published in

the *Proceedings of the Cotteswold Club*. Our contributor, Rev. Desmond Murray, sends us a reprint of his article in the *Journ. of the Ent. Soc. of S. Africa*, "The Genus *Cupido* (Lepidoptera-Lycaenidae) in South Africa," with 2 plates of structures; a useful record of investigation for students interested in the Lycaenidae. Captain Dannreuther has sent us his article reprinted from the *Proceedings of the Littlehampton Nat. Science, etc., Soc.*, "The Dragonflies of West Sussex." This is a very complete summary of all the records of captures and all areas from which each species has been obtained; as might be expected from the very thorough energy this author usually puts into whatever he does. This study is based on the numerous river valleys which are found along a long seaside county. That ceaseless worker, Capt. Kenneth J. Hayward, so long resident in the Argentine, with the aid of B. C. Williams (U.S.A.), sent us the "Catalogue of the *Hesperiidae* of the Republic of Ecuador," published at Tucuman in the *Act. Zool. Lillo. Inst. Miguel Lillo.*; a well-printed book of 250 pp. with an excellent Index. Very full references are given and notes are added to many species. Prof. Bryan P. Beirne has sent us a reprint of his article in *The Irish Naturalists' Journal*, "New Records for Irish Lepidoptera" not included in the Catalogues of either Donovan or Beirne; also from the *Proc. Royal Irish Acad.* a reprint of his paper, "The Male Genitalia of the British *Nepticulidae* (*Stigmellidae*)," a section of the Tineina not covered by the works of Piercé. Seven plates and a number of text-figures are added, all diagrammatic. Let us hope this matter of genitalia will soon fall into its place with nervures, mouth parts, etc., and not further divert our attention from the biological study of these fascinating creatures.

AMONG the foreign magazines recently to hand, the *Revista Soc. Ent. Argentina*, vol. IV, no. 4, contains 16 articles, 10 of which deal with Lepidoptera, all but two Lists illustrated with plates and text-figures. Two plates are coloured. The Lepidoptera are:—A new var. of *Callicore candrena*; the metamorphoses of a little known Pyrale; Melanism in Argentine Lepidoptera; Notes on a Notodontid, *Neobourquia bifasciata*; The genus *Rothschildia* in Tucuman (2 notes with illustrations); Notes on *Automeris* species; Lists of Lepidoptera collected in Salta and in Catamarca. Other articles treat of Coleoptera, Hymenoptera, Diptera, and an Ecological, Zoogeographical and Systematic paper on the Acridiidae of the Argentine with 6 figures of species and 20 of the habitats of various species. Altogether this is one of the most interesting and valuable series of Memoirs advancing our knowledge of the Argentine Insect Fauna. There is also the Obituary of the famous Spanish entomologist, Ignacio Bolivar, who died in 1944 at the age of 94. It will be remembered he was driven from his native land after the Revolution.

THE *Pan-Pacific Entomologist* for July contains a record of the "Longevity of a fifth-instar Larva" (*Hornia boharti*, Insly., Col.); An account of the Migration of *Vanessa cardui* in California; numerous notes on Diptera, Coleoptera, Hemiptera, etc., and descriptions of new species.

RECENTLY among the exhibits at the London Natural History Society were a specimen of *Herse convolvuli*, L., taken in Hammersmith, and shown by Mr L. G. Payne, and a case of Tachinid flies shown by Lt. L. Parmenter, of parasitic species, whose larvae feed on the larvae of the Sphingidae, viz.:—*Phryxe vulgaris*, Fln., *Exorista larvorum*, L., *Thelavia nigripes*, Fab., *Servillia lurida*, Fab., *Echinomyia grossa*, L., *Micropalpus vulpinus*, Fln., *Ernestia radicum*, Fab., *Lydella nigripes*, Fln.

Mr J. Ross read a paper on the species of Cynipid Flies inducing galls on oaks, and drew attention to the work done by various Members of the Society in confirming the investigations of Dr H. Adler in Germany into the question of Alternation of Generation. Several of these alternate forms had been confirmed and others added to the list, including *Andricus furunculus*, Bjck., linked with *A. ostreus*, Gir., *A. xanthopsis*, Schl., with *A. glandulae*, Schenck, and *A. occultus*, Tschek, with *A. solitarius*, Fonsc.—H. J. BURKILL.

Volumes V, VI, VII, VIII and IX (1940-1944) of the Proceedings of the Swedish "Societas Entomologica Lundensis," *Opuscula Entomologica* has recently come to hand. This Society carries on its activities under the auspices of the University of Lund, and publishes very valuable papers on all orders of Insects. In Vol. V. Benander contributes a "Revision of the work of Zetterstedt on the Microlepidoptera of Lapland" (1840). Reference is made to the connection of Zetterstedt with our British H. T. Stainton. Vol. VII contains a paper on "The Variability of *Papilio machaon* by Wahlgren, and a memoir giving the details and results of three cross pairings of Micro-Lepidoptera, viz., *Choreutis myllorana* × *C. punctosa*; *Epiblema solandriana* × *E. brunnichana*, and *Epiblema expallidana* × *E. scorzonera*, illustrated with figures of the genitalia; the latter article by Benander. In Vol. VIII Wahlgren continues his Notes of *P. machaon*; Kjellander discusses the history of *Pararge achemine*, its relationship and distribution including its accompanying variation: A portion of the "Catalogue of Insects of Sweden" is given: and Wahlgren goes further in his consideration of *P. machaon*, this time treating of larva and pupa. In Vol. IX Ander gives notes on the distribution of the genus *Adopoea*, Billberg., with a map of the distribution of *A. lineolea* in Sweden. Perhaps the most interesting article to our British collectors is that of Benander, "A Memoir of the *Lithocolletis* (*Gracillariidae*). The writer gives a summary of the works of the various authors of the past, who have especially considered this Family. The foodplants of the larvae, with the species attacking each, are given. Tables for the identification of the species are given for each section or genus and each species is considered apart with its life-history. About 80 species are illustrated by b. and w. figures of wing-marking. Altogether this memoir is of great use to those who wish to know these small but interesting and beautiful of our Lepidoptera. In 1941 a Supplement (III) was published by the Society, on the "Ecology of the Collembola in Swedish Lapland." These volumes also contain many articles on other Orders of Insects indigenous in Northern Sweden, Lapland, etc., Notes of captures, new species, experimental work, etc., of which we have not room to mention, evidence of most useful work done under very especial climatic conditions.

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- II. Some Sense-organs of Moths. Agrotidae, to face page 61.
- III. Some Captures of Notable Aberrations of Lepidoptera, to face page 77.
(By kind permission of the Amateur Entomologists' Society.)
- IV. Peroneural Defect in *Brenthis euphrosyne*, to face page 109.

Hyppa, Dup. (1844), H.-S., Gn., Barr., Stdgr., Splr., South, Culot: [*Lithomoia*, Hb. (1821), Hamp., Warr.-Stz., Drdt.-Stz.; *Hadena*, Ochs. & Treit. (1816-25), Gn., Meyr., Meyr.: *Xylina*, Ochs. & Tr. (1816-25), Frr.] *rectilinea*, Esp. (1789).

Tutt, *Brit. Noct.*, 95 (1892): Meyr., *Handbk.*, 129 (1895): Barr., *Lep. Br. Is.*, V, 35, plt. 159, 1 (1899): Stdgr., *Cat.*, IIIed., 182 (1901): Splr., *Schmet. Eur.*, I, 207, plt. 41, 12 (1905): South, *M.B.I.*, I, 265, plt. 126, 6-7 (1907): Hamp., *Lep. Phal.*, VIII, 209, fig. 41 (1909): Warr.-Stz., *Pal. Noct.*, III, 203, plt. 42d (1910): Culot, *N. et G.*, I (1), 197, plt. 36, 9 (1913): Meyr., *Rev. Handb.*, 82 (1928): Drdt.-Stz., *Pal. Noct. Sup.*, III, 172 (1934).

Esp., *Noct.*, IV, 379, plt. 127, 1 (1789+?), gave a poor figure of this species with the lighter marking much suffused.

Ernst & Engr., *Pap. d'Eur.*, VI, 163, f. 385a (1791): Wernbg. identified the figure as *rectilinea*.

Hb., *Samml. Noct.*, 248 (1802), gave a very good figure with outer marginal area lighter than is usual.

Dup., *Hist. Nat. Noct.*, VII (1), 231, plt. 114, 6 (1827), gave a very good figure of a well-marked example. *Xylina*.

Steph., *Ill.*, II, 179, placed *rectilinea* in the genus *Xylophasia*. He said it was not the *rectilinea*, Haw.

Treit., *Schm.*, V (3), 61 (1826), said that the fig. of Hüb. was generally correct, but wanting in size and colouring.

Frr., *Beitr.*, I, 18, plt. IV, 1 (1827), gave a very incorrect figure, in fact, unrecognizable. In his *Neu. Beitr.*, I, 101, plt. 51, he gave two other figures, by no means good, but recognizable by some of the correct and usual markings.

H.-S., *Syst. Bearb.*, II, 289 (1850), said that the first fig. of Frr. was very crude, but his later figs. were good.

Gn., *Hist. Nat.*, VI, 105 (1852), noted that the *rectilinea*, Haw., was not this species but the *w-latinum*. He also recorded a form in which the median area was wholly maroon-brown which restricts the black, only clear in the upper part of the basal half. Spots are almost absorbed by the brown. Scotland.

Barrett, *l.c.*, plt. 189, gave ♂ and ♀ figures, the ♀ having more lighter areas than the ♂.

Stdgr., *Cat.*, IIIed., 182 (1901), gave one f. *xylenoides*, Gn., and its syn. *xyliniiformis*, Gr.

Splr., *Schm. Eur.*, I, 207, plt. 41, 12 (1905), gave a very good figure of a typical form and included three forms: ab. *virgata*, Tutt, ab. *xylinoides*, Gn., and described ab. *grisea* without brown marking on forewing.

South, *M.B.I.*, I, 265, plt. 126, 6-7 (1907), gave two varied examples. Hamp., *Lep. Phal.*, VIII, 209, f. 41 (1909), used the genus *Lithomoia*, Hb., and placed it in the Section *Acronyctinae*.

Warr.-Stz., *Pal. Noct.*, III, 203, plt. 42d (1911), gave a figure of the typical form.

Culot, *N. et G.*, I (1), 197, plt. 36, 9 (1913), gave a good figure. It varies by the more or less emphasis of marking.

Drdt.-Stz., *Pal. Noct. Supp.*, III, 172 (1934), recorded ab. *virgata* and figured it plt. 20b, and ab. *grisea*, Splr., greyer.

Of the Variation Barrett wrote:—

There is local variation in the colouring of this species, specimens from the East of Scotland having the chocolate-brown band and clouding less bright and more shaded with slate-grey. In the collection of the late Mr H. Doubleday at Bethnal Green, are specimens (unfortunately not labelled) which show scarcely any of the red-brown colouring, their ground colour being greyish-white, the clouding darker grey, and the central band olive-brown. Occasionally the space around the reniform stigma is conspicuously pale, forming a large rounded grey section scooped out of the broad red-brown band. On the other hand a specimen in the collection of Mr W. H. B. Fletcher is banded with very rich dark brown; while others have the central band broken up by white clouds.

The Names and Forms to be considered:—

rectilinea, Esp. (1789+?), IV, 379, plt. 127, 1.

xylinoides, Gn. (1852), *Hist. Nat. Noct.*, VI, 105. Syn.? Amer. f.

ab. *semivirgata*, Tutt (1892), *Brit. Noct.*, 95.

ab. *virgata*, Tutt, l.c.

ab. *grisea*, Splr. (1905), *Schmet. Eur.*, I, 207, plt. 41, 12.

Tutt dealt with: (1) the type form as illustrated by Esp. & Newman; (2) ab. *semivirgata*, with a band below the stigmata to inner margin; (3) ab. *virgata* with a complete central band.

ab. *xylinoides*, Gn., *Hist. Nat. Noct.*, VI (2), 106.

ORIG. DESCRIP.—“It resembles *rectilinea* extremely, from which it does not appear to differ at the first except by its antennae, which are strongly pectinated. However, on close investigation one sees that its upper wings are more elongate; the extra-basal line forms very sharp teeth; on the contrary, the elbowed line is straighter and does not form a tooth opposite to the black feature; the median spots are less detached and more finely circled with black; the lower wings are more uniform and lighter; the abdomen less rosy at the extremity.” North America.

ab. *grisea*, Splr., *Schm. Eur.*, I, 207 (1905), called specimens without brown colour ab. *grisea*. (His note said that Tutt considered the “fusco-cinereus” of Esper’s diagnosis, and H.-S., it was not the typical form, but *semivirgata*.)

Xylocampa, Gn. (1841)-(1852), Barr., *Stdgr.*, Splr., South, Culot: [*Dichonia*, Hb. (1821), Hamps., Warr.-Stz., Drdt.-Stz.: *Xylina*, Ochs. & Tr. (1816-25)] *areola*, Esp. (1791+).

Tutt, *Brit. Noct.*, III, 97 (1892): Meyr., *Handb.*, 52 (1895): Barr., *Lep. Br. Is.*, VI, 43, plt. 236, 2 (1900): *Stdgr.*, *Cat.*, III ed., 212 (1901): Splr., *Schm. Eur.*, I, 263, plt. 41, 21 (1907): Hamps., *Lep. Phal.*, VI, 294, f. 88 (1906): South, *M.B.I.*, II, 33, plt. 12, 7 (1908): Warr.-Stz., *Pal. Noct.*, III, 128, plt. 31f (1910): Culot, *Noct. et G.*, I (2), 97, plt. 57, 9 (1913): Meyr., *Rev. Handb.*, 132 (1928): Drdt.-Stz., *Supp. Pal. Noct.*, III, 137 (1934).

Ernst & Engr., *Pap. d'Eur.*, VI, 12, f. 29a, b (1788), gave two figures much too dark.

Bork., *Naturg.*, IV, 340 (1792), redescribed the species and cited Esper's *areola* with a ?. He himself called it *lithorhiza*. He also cited *Pap. d'Eur.*, VI, fig. 290 (1788).

Esper, *Noct.*, IV, 448, plt. 141, 4 (1788+?), gave a crude and hard figure with contrast of ground and marking much exaggerated, under the name *areola*.

Hb., *Samml. Noct.*, 398 (1803-8), gave the figure of a form under the name *operosa* (but under the name *lithorhiza* in his *Text*, p. 188). Geyer, *l.c.*, 764, gave another figure much more normal.

Dup., *Hist. Nat. Noct.*, VII (1), 191, plt. 112, 4 (1827), gave an excellent figure.

Frey., *Beitr.*, II, 75, plt. 70, 2 (1829), gave a very dark figure, black-grey with a few white conspicuous small spots not characteristic of the species, and the black basal line continued with intervals to the outer margin. Not a good figure, under the name *lithorhiza*.

H.-S. used the name *lithorhiza*, Bork., although he cited *areola*, Esp., and *operosa*, Hb.

Sys. Bearb., II, p. 289 (1850). Of Hb. 398 (*operosa*) he said the fore-wing was much too wide behind and the light markings too sharp. Hb.-Gey. 764-5 were good.

Gn., *Hist. Nat.*, VI, 110 (1852), used the name *lithorhiza*, Bork., and cited *areola*, Esp., and *operosa*, Hb.

Stdgr., *Cat.*, IIIed., 212 (1901), cited *operosa* and *lithorhiza* as Syns.

Hamp., *Lep. Phal.*, VI, 294, f. 88 (1906), described a much greyer form from Hyères, which Strand subsequently named *hyerensis*. He cited *lithorhiza*, Bork., and *operosa*, Hb.

Splr., *Schm. Eur.*, I, 261, plt. 47, 21 (1907), gave a very good figure and included the ab. *suffusa*, Tutt.

South, *M.B.I.*, II, 33, plt. 12, 7 (1908), gave a very good figure typical and reported two forms, ab. *suffusa*, Tutt, and ab. *rosea*, Tutt; a dark and a rosy form. He also gave a beautiful figure of an example on the bark of a tree.

Warr.-Stz., *Pal. Noct.*, III, 128, plt. 31f (1910), gave two figures, ♂ and ♀ of a typical form. They recognised a dark form *suffusa*, Tutt. The figures are bad for colour, a rich brown instead of a pale grey ground. They considered *lithorhiza*, Bork., and *operosa*, Hb., as Syns.

Culot., *N. et G.*, I (2), 97, plt. 57, 9 (1915), gave a very good figure which varies only very slightly in lighter or darker scaling.

Drdt.-Stz., *Pal. Noct. Supp.*, III, 137 (1934), recorded ab. *rosea*, Tutt, ab. *kanei*, Rbl., ab. *hyerensis*, Strnd. (= *modesta*, Warn.) and illustrated it on plt. 17h, and ab. *mustapha*, Obthr.

In the opinion of Drdt.-Stz. (1934) *modesta*, Warn., is the same as *hyerensis*, Strnd, and *mustapha*, Obthr., is "approximately the same."

Barrett remarked on the Variation that:—

"Only a little variable in the intensity of the dusting of black, and of the flush of purple, or of grey, in the ground colour, but in some specimens the stigmata are tinged with purplish-red rather than grey, or the longitudinal stripe of black atoms partially disappears."

The Names and Forms to be considered:—

areola, Esp. (1791+?), *Abbild. Noct.*, IV, 448, plt. 141, 4.

lithorhiza, Bork. (1792), *Naturg. Noct.*, IV, 339. (Syn.)

operosa, Hb. (1803-8), *Samll. Noct.*, f. 398. *Text*, p. 188, No. 41, as *lithorhiza*. (Syn.)

ab. *suffusa*, Tutt (1892), *Brit. Noct.*, III, 97.

ab. *rosea*, Tutt (1892), *l.c.*

[ab. *kanei*] Kane (1896), *Ent.*, XXIX, 160 (no name).

[ab. *hyerensis*] Hampson (1906), *Lep. Phal. Noct.*, VI, 295 (no name).

ab. *kanei*, Rbl. (1909), *Berge Schm.*, IXed., 254.

ab. *hyerensis*, Strand (1915), *Arch. Naturg.*, A., LXXXI, 12, 148.

ab. *mustapha*, Obthr. (1918), *Lep. Comp.*, XVI, 164, plt. 496, f. 4124.

ab. *rhodana*, Derenne (1919), *Rev. Mens.*, XIX, 38.

ab. *modesta*, Warnk. (1934), *Neu. Beitr. Sys. Ins.*, II, 93. (Syn.) of *hyerensis*.

ab. ***pediculata***, Hy. J. T., nov. ab.

ab. ***deficiens***, Hy. J. T., nov. ab.

Tutt dealt with: (1) Esper's type, the pale ashy-grey, slightly fuscous; (2) *suffusa*, with a blackish-grey ground with distinct marking, and (3) *rosea*, with ground colour suffused with rose.

[ab. *kanei*], *Ent.*, XXIX, 160 (1896).

ORIG. DESCRIP.—“A strikingly pale aberration, freshly emerged, was taken by me (Kane) at Arklow, having no trace of black dashes or lines. The pale blotches and antemarginal band are of dirty white, showing upon a uniform pale yellow ground.” Ireland (not named).

ab. *kanei*, Rbl., *Berge*, IXed., p. 254 (1909):—DESCRIP.—“Forewings with dusky-white ground colour and brown-yellow in place of blackish marking.” Ireland.

ab. [*hyerensis*, Strnd.], Hamp., *Cat. Lep. Ph.*, VI, 295 (1906).

ORIG. DESCRIP.—“Much greyer.” Hyères, Andalusia.

ab. *hyerensis*, Strand, *Arch. f. Naturg.* (1915), LXXXI, A. 12, 148. “Is of a more grey tint than the typical form.” Provence. Hyères, Andalusia.

var. *mustapha*, Obthr., *Lep. Comp.*, XVI, 164.

FIG.—plt. 496, fig. 4124 (1918).

ORIG. DESCRIP.—“The markings largely obliterated and the ground colour of the wings is deep grey.” Algeria. Said by Drdt.-Stz. to be much like *hyerensis*, Strnd., as is *modesta*, Wrnk., *Neu. Beitr. Sys. Ins.*, II, 93.

ab. *rhodana*, Derenne, *Rev. Mens.*, XIX, 38 (1919).

ORIG. DESCRIP.—“La teinte du fond des ailes antérieures est rosée ainsi que la bordure marginale des postérieures. Le duvet couvrant le corps est également rosé.

“Cette teinte rosée donne aux papillons un aspect remarquable, se trouve assez communément chaque année avec le type fort abondant à la promenade de la citadelle de Namur, bois de la Vesquée en mars-avril.”

ab. ***pediculata***, nov. ab.

ORIG. DESCRIP.—“Occasionally on the middle of the inner margin of the f.w. a square black blotch is found joining up with the conspicuous

black mass below the stigmata as a pedicel supporting it. This is sometimes imperfectly marked out but not filled. We note those with the perfect marking ab. *pediculata*."

ab. *deficiens*, nov.

ORIG. DESCRIP.—I have two Bulgarian examples with the whole of the usual white or whitish ground very pale grey in one and darker grey in the other. In both the deep black bar is absent from the base, but its continuation remains and bends upward to the costa forming the darker two "bags" in which the orbicular and reniform stigmata are suspended, respectively. The latter has a somewhat similar development, but with the orbicular only in a "bag." This developed marking is deep black in both. The rest of the black markings in both examples are two blotches on outer margin. In fact the black area gives the appearance of a fascia extending only half across the wing with the lighter orbicular and reniform lying in it.

Scoliopteryx, Germ. (1811), H.-S., Myr., Stdgr., Splr., Sth., Warr.-Stz., Culot, Meyr., Drdt.-Stz. [*Gonoptera*, Latr. (1825), Dup., Gn.] *libatrix*, L. (1788).

Tutt, *Brit. Noct.*, III, 97 (1892): Meyr., *Handb.*, 186 (1895): Barr., *Lep. Br. Is.*, VI, 239, plt. 252 (1900): Stdgr., *Cat.*, III, 234 (1901): Splr., *Schm. Eur.*, I, 297, plt. 47, 4 (1907): South, *M.B.I.*, II, 63, plt. 22, 1 (1908): Warr.-Stz., *Pal. Noct.*, III, 361, plt. 52n (1913): Culot, *N. et G.*, I (2), 163, plt. 70, 3 (1916); Meyr., *Rev. Hand.*, 169 (1928): Drdt.-Stz., *Pal. Noct. Supp.*, III, 223 (1936).

Early Entomologists classed *libatrix* as a *Bombyx*. It was so placed by Lin. in *Sys. Nat.* (1758).

Rösel., *Belust. Ins.*, IV, plt. 20 (1760+). A very fair figure, appearance too heavy.

Esper, *Noct.*, III, 357, plt. 69, 4-7 (1782+ ?), gave a good figure.

Ernst & Engr., *Pap. d'Eur.*, V, 95, 258b, c, d (1788), gave three rather miss-shapen figures.

Bork., *Naturg.*, III, 428 (1790), *Ph. Bombyx*. Cited all earlier authors.

Hb., *Samml. Noct.*, 436 (1808-9), gave a by no means good figure.

Dup., *Hist. Nat. Noct.*, VII (1), 478, plt. 131, 1 (1827), gave a very good figure.

Steph., *Ill.*, III, 50 (1829), used the genus name *Calyptra*, Ochs. Curtis, who was bitterly opposed to Steph., remarked that it should be *Scoliopteryx*, Germ.

Treit., *Schmett. Noct.*, V (2), 173 (1825), cited no less than 36 references in older literature, and said that it occurred all over Europe and at first had been classified with the Bombyces near *thalictri* but that Fab. placed it in the Noctuae (Eulen); while Ochs. put both species with the Noctuae. Treit. considered it *modesta* of Müll. and of Götze.

H.-S., *Sys. Bearb.*, II, 319, said that Hb. fig. 436 was too roughly toothed and hindwings too dusky.

Meyr., *Handb.*, 184 (1895), used the genus *Scoliopteryx*.

Stdgr., *Cat.*, III, 234 (1901), used the genus name *Scoliopteryx*, Germ.

Splr., *Schm. Eur.*, I, 297, plt. 47, 4 (1907), gave a very fair figure and included the form *ab. suffusa*, Tutt.

South, *M.B.I.*, II, 63, plt. 22, 1 (1908), gave a very good figure of a red form.

Warr.-Stz., *Pal. Noct.*, III, 361, plt. 52n (1913), gave a good figure of a typical form. They included the three aberrations, *ab. suffusa*, a scarce dark form; *ab. pallidior*, pale whitish-grey, and *ab. pallida*, Splr., the pale more yellowish specimens from Turkestan.

Culot, *N. et G.*, I (2), 163, plt. 70, 3 (1916), gave an excellent figure.

Meyr., *Rev. Handb.*, 169 (1928).

Drdt.-Stz., *Pal. Noct. Supp.*, III, 223 (1936), illustrated the form *pallida*, Splr., plt. 23i, and recorded *ab. besti*, Osth.

Of the Variation C. G. Barrett said:—

Hardly variable, or only so in the general tone of colour, darker or paler, and in some degree in the extent of orange-red clouding.

The Names and Forms to be considered:—

libatrix, L. (1758), *Sys. Nat.*, Xed., 507. *Bombyx*.

ab. suffusa, Tutt (1892), *Brit. Noct.*, III, 97.

ab. pallidior, Splr. (1907), *Schmett. Eur.*, I, 297.

ab. pallida, Splr. (1907), *l.c.*

ab. besti, Lenz. (1927), *Osth. Schmett. Sudbay*, II (2), 349 (1927).

Tutt dealt with the two Linn. descriptions, *Sys. Nat.*, 507, and *Fn. Suec.*, 304, and he named the dull greyish-fuscous form with no red on the outer margin of the forewings.

ab. pallidior, Splr., *Schm. Eur.*, I, 297 (1907).

ORIG. DESCRIP.—“Pale whitish shining grey.” N. Mediterranean area and Asia Minor.

ab. pallida, Splr., *l.c.*

ORIG. DESCRIP.—“A very clear coloured and sharply marked form, paler yellowish specimens” from Turkistan.

ab. ♀ besti, Lenz., *Osth. Schm. Sudbay*, II (2), 349 (1927).

ORIG. DESCRIP.—“Forewing of a uniform dark violet-grey ground colour with reddish suffusion. Whitish markings strongly reduced and with grey suffusion. Both transverse lines of the forewings much approached and anastomosed on the inner margin.”

Xylina, Ochs. & Tr. (1816-25), Dup., Steph., Barr., Stdgr., Splr., South, Culot [*Polia*, Ochs. & Tr. (1816-25), Meyr. (1), Meyr. (2): *Lithophane*, Hb. (1821), Warr.-Stz., Drdt.-Stz.: *Graptolitha*, Hb. (1821), Hamps., South] *ornitopus*, Hufn. (1766) (*ornithopus rect.* Stdgr.).

Tutt, *Brit. Noct.*, III, 99 (1892): Meyr., *Handbk.*, 52 (1895): Barr., *Lep. Br. Is.*, VI, 39, plt. 236, 1 (1900): Stdgr., *Cat.*, IIIed., 211 (1901): Hamps., *Lep. Phal.*, VI, 258 (1906): Splr., *Schm. Eur.*, I, 260, plt. 47, 10 (1907): South, *M.B.I.*, II, 31, plt. 12, 6 (1908): Warr.-Stz., *Pal. Noct.*, III, 128, plt. 30h (1910): Culot, *N. et G.*, I (2), 94, plt. 56, 16 (1914): Drdt.-Stz., *Pal. Noct. Supp.*, III, 137 (1934).

In the *Berl. Mag.*, III, 309 (1766), Hufnagel described a *Noctua* under the name *ornitopus*. The description was short but recognizable as agreeing with the figures in later authors.

In (1775) Schiff. in his *Verz.*, 75, named the same species he had bred from oak without adequate description with the name *rhizolitha*.

Subsequently Fab., *Mantissa*, p. 182 (1787), somewhat more fully described it and used the name brought forward by Schiff. in the *Verz.*

Esper, about (1788-?) more fully described the species in *Abbild.*, IV, 317, and on plate 121 gave a very good figure of a light whitish-grey marked male under the name *rhizolitha*, under which it went for many years. Now it is known by the original name *ornitopus*, often spelt with an *h*, *ornithopus*. Why the change is used I have been unable to trace.

Thus *rhizolitha* becomes a *Synonym*.

Tutt gave the original description from Hufnagel *ornitopus* and also the somewhat longer subsequent description given by Fab., *Mantissa*, 182 (*rhizolitha*).

Ernst & Engr., *Pap. d'Eur.*, VI, 4, f. 284a, b, c, d (1788), gave quite good figures, 2 upper and 2 under.

Esper., *Noct.*, IV, 317, plt. 121, 6 (1789+), gave a passable figure as *rhizolitha*. (Also p. 358, plt. 125B.)

Hb., *Samml. Noct.*, 242 (1800-3), gave a very good figure under the name *rhizolitha*.

Steph., *Ill.*, II, 170 (1829), described it under the name *rhizolitha*. He put *lambda*, ? as a *Syn*.

Dup., *Hist. Nat. Noct.*, VII (1), 187, plt. 112, 3 (1827), gave an excellent figure under the name *rhizolitha*.

Treit., *Schmett.*, V (3), 21 (1826), named and described this species as *rhizolitha*.

Gn., *Hist. Nat.*, VI, 119 (1852), said it was the *lambda*, Haw. *Lep. Brit.* (61), p. 181 (1809).

H.-S., *Sys. Bearb.*, II, 305 (1850), gave the *Verz.*, Schiff., as the authority for *rhizolitha*. Authors refer *rhizolitha* to diverse authors—Esp., Fab., Tr., Bork., etc.

Meyr., *Handbk.*, 52 (1895), used the genus *Polia* and the Hufn. name *ornitopus* with *h* inserted. In his *Revised Hbk.*, 132 (1928), he gave the same nomenclature.

Stdgr., *Cat.*, IIIed., 211 (1901), treated *rhizolitha*, Tr., Esp., and *pruinosa*, Butlr., as *Syns*.

Stdgr., *Cat.*, IIIed. (1901), 211, used the correct spelling of the name *ornitopus*, Hufn., gave the *Syn. rhizolitha*, Tr. & Esp., and *pruinosa*, Butlr. (now considered a species).

Hamp., *Lep. Phal.*, VI, 258 (1906), cited *rhizolitha*, Schiff.

Splr., *Schm. Eur.*, I, 260, plt. 47, 10 (1907), gave a good figure of a typical form, and included a form ab. *pallida*.

South, *M.B.I.*, II, 31, plt. 12, 6 (1908), gave a very good figure of the typical form.

Warr.-Stz., *Pal. Noct.*, III, 128, plt. 30h (1910), gave two figures, a typical form and ab. *pallida*. Good figures generally, but the grey was too dark; *pallida* is a white-grey.

Culot, N. *et G.*, I (2), 94, pl. 56, 16 (1914), gave a very good figure of the typical form.

Drdt.-Stz., *Pal. Noct. Supp.*, III, 137 (1934), *ornitopus* with genus name *Lithophane*, Hb. Three fresh forms are reported *duebenia*, Strand comparable to the banded *P. serena*; *lactipennis*, Dadd., and race *japonica*, Neuberger.

Barrett remarked on the Variation:

"Hardly variable, though occasionally the ground colour is a little tinged with smoky-grey, in which case the stigmata usually remain pale."

The Names and Forms to be considered:

ornitopus, Hufn. (1766), *Berlin Mag.*, III, 309.

rhizolitha, Schiff. (1775), *Verz.*, 75. Syn.

rhizolitha, Fab. (1787), *Mant.*, 182. Syn.

rhizolitha, Esp. (1788+?), *Abbild.*, IV, 317, pl. 121, 6. Syn.

r. japonica, Neubgr. (193), *Soc. Ent.*, XVIII, 113 (1903).

ab. *pallida*, Splr. (1907), *Schm. Eur.*, I, 260.

r. or spp. *lactipennis*, Dadd. (1911), *Ent. Record*, XXIII, 97.

ab. *duebenia*, Strnd. (1912), *Ent. Zeit.*, XXV, 258.

ab. *reducta*, ab nov.

Tutt dealt with the typical form very briefly, stating that British examples are of a purer white, quoting Hufn. and Fab. (*rhizolitha*). (Dadd. named the British form ssp. *lactipennis* in 1911.)

var. *japonica*, Neubgr., *Soc. Ent.*, XVIII, 113 (1903).

ORIG. DESCRIP.—"The Japanese specimens are quite dark grey, whereas European examples appear to be pale grey or brownish-grey coloured. In addition the Japanese specimens want any suggestion of a red-brown or rusty-brown colour of the reniform, so that the forewings and thorax are uniformly dark grey (mouse-grey) coloured. Butler has described a closely allied species from Japan as *X. pruinosa*. The species appears to be very rare in Japan, in contrast with Europe, and is quite absent on the Amur, where Graeser has not yet found it."

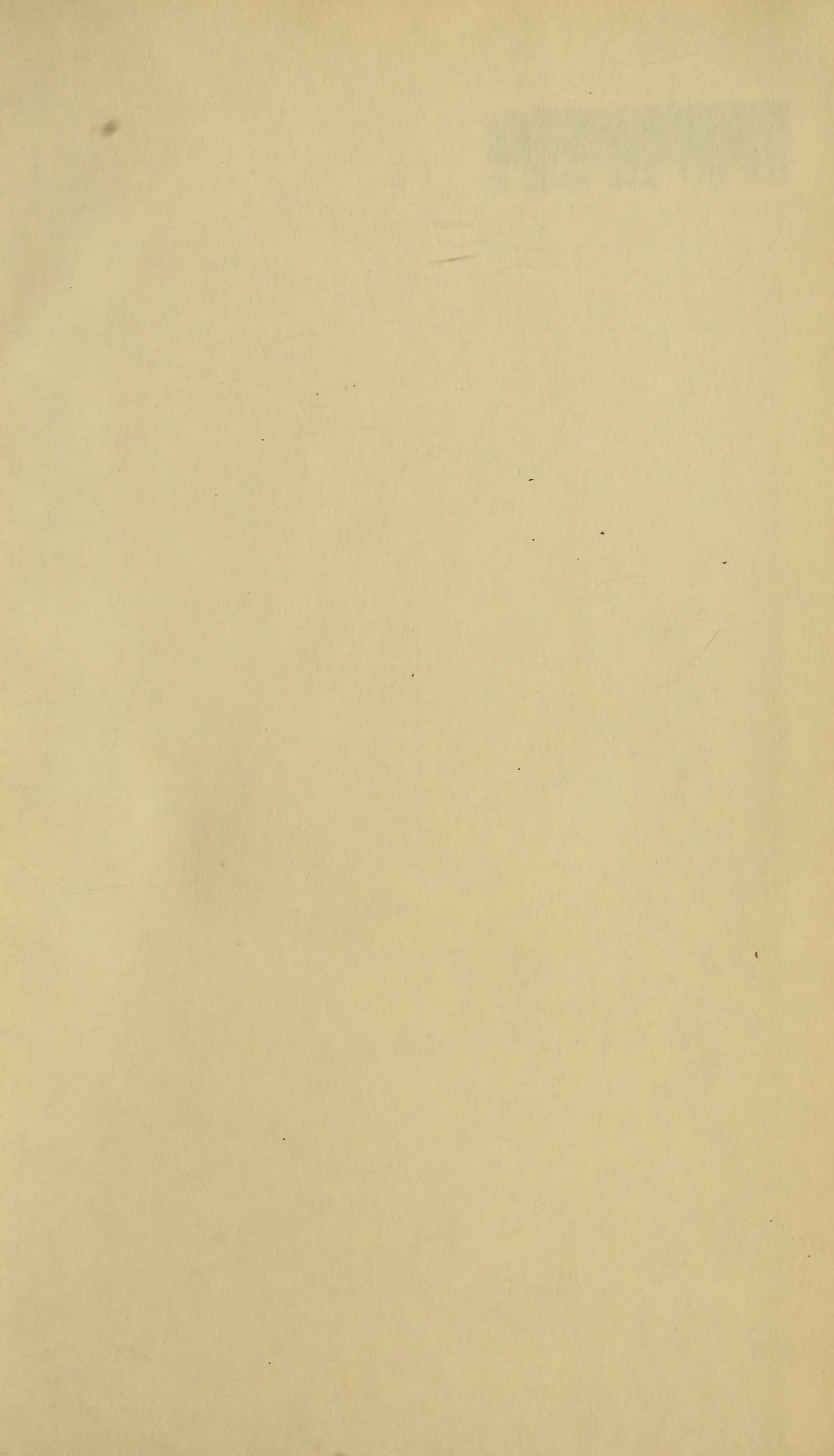
The *pruinosa*, Btlr., from Japan, was at first considered to be a form of *ornitopus*, Hufn.

var. *lactipennis*, Dadd., *Ent. Rec.*, XXIII, 97 (1911).

ORIG. DESCRIP.—"I possess a fairly long series of this species from the New Forest and have taken it in large numbers in various localities in Germany. The English series show up very prominently on account of their conspicuous whiteness, and one would have no difficulty in picking them out at a considerable distance. As the whole of my English specimens are of this form. . . I therefore propose to christen it as *X. ornitopus* var. *lactipennis*."

ab. *pallida*, Splr., *Schm. Eur.*, I, 260 (1907).

ORIG. DESCRIP.—"Either purer grey-white, thin black-grey and black marked, or paler yellowish-grey-white with at most brown-grey, little of the usual marking and paler brownish hindwings." The first Erlangen, the other Karlsruhe.





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